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The NEW ZEALAND JOURNAL OF AGRICULTURE

Vol. 62 WELLINGTON, APRIL 15, 1941. No. 4

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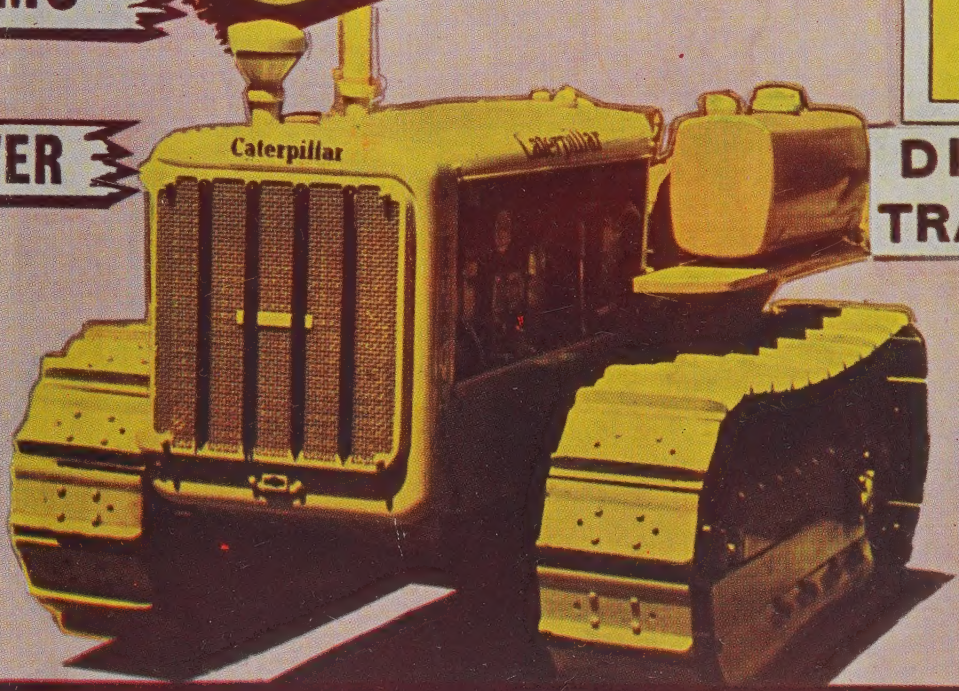

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Vol. 62 WELLINGTON, APRIL 15, 1941. No. 4

AGRICULTURAL SURPLUSES OF THE DANUBE BASIN

The present war has tended to reduce the food supplies from Continental Europe for two reasons:—(1) Domestic production in both belligerent and neutral countries has been adversely affected by shortage of fertilizers, labour, and farm machinery, by transportation difficulties, and by actual devastation; and (2) supplies from overseas have been sharply curtailed by the British blockade. Under these conditions the Danube Basin is of special significance, since it is one of the chief potential sources of supply for farm products sorely needed by Greater Germany, Italy, the conquered countries, and the still neutral countries of Europe.

By

*Frederick Strauss.**

THE countries of the lower Danube Basin—Rumania, Hungary, Yugoslavia, and Bulgaria—have long been the most important European producers of staple farm surpluses. Since 1933 National Socialist Germany has been exerting great effort to bring about an expansion in the farm output of the Danubian countries and to establish itself as the dominating factor in determining the distribution of their agricultural surpluses.

The importance of the Danube Basin as a potential source of supply for farm products has been greatly enhanced by the war. The British blockade of Norway, the Netherlands, Belgium, France, Italy, and North Africa further increased the demand for the Danubian foodstuffs and feedstuffs. The maintenance of livestock production and the assurance of adequate food supplies generally in the countries under German domination depend to a considerable extent on the volume of food and feedstuff supplies forthcoming from the Danubian countries during the war.

Italy and Switzerland also are increasingly attempting to draw upon the agricultural resources of the Danube Basin. Efforts by the United Kingdom to contract for large deliveries of farm products from Danubian areas were terminated with the entry of Italy into the war. Exports formerly sent to the British market will now be available for shipment to the countries under German and Italian domination, as far as current surpluses allow.

Chief German Source

It is obvious that the Danube Basin must remain, for the present at least,

**Agricultural Economist, Office of Foreign Agricultural Relations, United States Department of Agriculture.*

The Axis Powers Are Still Far From Self-Sufficiency

the chief potential foreign source of supply for the farm products needed by Greater Germany and by the conquered and the still neutral European countries.

The crucial question is the extent to which the Danube Basin will be able to meet the sharply increased demand for such products. For the immediate future, this ability will be determined largely by current crop conditions, the effects of war on the acreage planted to various crops, by the efficiency of transportation facilities, and by changes in domestic consumption brought about by the present war.

An appraisal of potential exports during a long war must take into consideration other important factors, outstanding among them the question of whether or not the countries of the Danube Basin can adapt their farm practices to specific war-time demands. The answer to that question involves a consideration of the structure of the Danubian farm economies, the adaptability of the farm populations to changed conditions, and the possible effects of the war on agricultural practices.

Danube Basin Before the War

The European countries now blockaded by the British were far from self-sufficient in essential farm products before the outbreak of war. To indicate the situation only with respect to such strategic products as bread grains and feedstuffs, blockaded deficit Europe imported about 14 per cent. of its apparent bread-grain needs and over 20 per cent. of its total feed-grain requirements. These summary figures hide the significant fact that in some of the countries the role of imports was still more important; for instance, the countries now under complete German domination imported over 50 per cent. of their bread-grain and nearly 50 per cent. of their feed-grain requirements.

Moreover, the relatively favourable position of Continental Europe with regard to most animal products was more apparent than real. Denmark and the Netherlands had been able to supply the bulk of the import needs of Continental Europe for hog products, butter, and eggs. **These exports, however, depended largely on the availability of corn, oilseeds, and oilcake from overseas countries.** Of the total peace-time net imports of bread grains and feedstuffs (including feed grains, oilseeds, and oilcake) by Continental deficit Europe, the Danube Basin could supply only a minor part.

The Danube Basin furnished only 37 per cent. of the Continental European wheat imports, 17 per cent. of the rye imports, 19 per cent. of the corn imports, 3 per cent. of the oats imports, and 23 per cent. of the barley imports.

To the imports of oilcake necessary for the maintenance of the European livestock industry, the Danubian countries contributed little more than 1 per cent. With respect to oilseed imports—the most important raw material for edible fats in most of these countries—less than 4 per cent. was derived from the Danube Basin. Most of these products came from countries to which Continental Europe has no access under present blockade conditions.

Even if Greater Germany had succeeded in monopolising Danubian surpluses before the war, they still would

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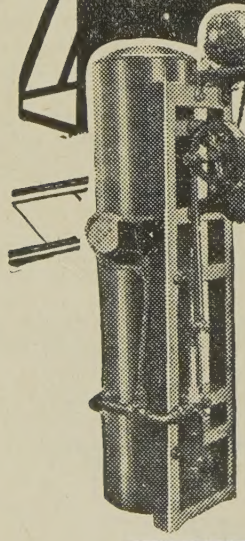

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have met fully the German peace-time import needs only for bread grains and dry beans. During 1935-1939, for example, total Danubian exports fell short of German import needs by 36 per cent. for feed grains, 95 per cent. for butter, 48 per cent. for eggs, 92 per cent. for oilseeds, and 97 per cent. for oilcake. In spite of all efforts, Germany actually obtained only 27 per cent. of the Danubian wheat surpluses and 47 per cent. of the corn exports during that period.

Present Role of Danube Basin

Germany now virtually dominates Rumania and Hungary, the most important Danubian surplus producers, and it is safe to anticipate that at best only a small part of the Yugoslavian and Bulgarian surpluses will find its way to other former customers, except Italy. [This article was written before the occupation of Bulgaria.]

The relative importance of the Danubian farm surpluses during this war, for the Axis as well as for total Continental European needs, will be determined by two sets of factors:—(1) Changed import requirements of the deficit countries as a result of war rationing and specific war influences on their domestic farm production; and (2) expansion potentialities of Danubian farm surpluses within the next few years.

It must be assumed that Germany and Italy will do everything possible to maintain their productive capacity of war instruments and the striking power of their armies. Therefore, those countries will endeavour to maintain at least the food rations that have been in force since the outbreak of the war. On the basis of the rations now prevailing in Germany, and considering the needs of the army and the occupational shifts resulting from the war, the war-time needs for most of the products that can be obtained from the Danube Basin are well above peace-time levels. The minimum war-time German bread-grain requirements, for instance, exceed peace-time needs by roughly 20 per cent. These additional needs alone correspond approximately to the total average Danubian bread-grain exports for 1935-1939.

Effects of War

The effects of the war on domestic farm production in most Continental European deficit countries are no less important. Intensive farming methods, built on the application of fertilisers and intensive labour, prevail in virtually all of those countries. Germany in particular has since 1933 pursued a policy of increasing yields per acre by exactly such methods of intensification, accompanied by increased mechanisation.

Lack of some essential fertilisers, especially phosphates, a varying degree of labour shortage, reduced numbers of draft animals, impossibility of further mechanisation, and shortage of fuel, binder twine, and other essentials, necessarily tend to curtail farm production in Continental Europe. Moreover, since by far the greater part of the formerly-imported feed concentrates will be unobtainable as long as the British blockade remains effective, meat and dairy production will be reduced in the highly-important livestock economies. In general, domestic production in all of the Continental European deficit countries cannot be maintained during the war, and will decrease continually as the war is prolonged. On the other hand, the total requirements for bread grains and the import needs for feed grains and feed concentrates are greater than before the war, at least in the belligerent countries.

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The 1940 Danubian surpluses were sharply diminished by adverse weather conditions. The unusually severe winter of 1939-1940 affected most crops, greatly reducing yield. In addition, the late spring and extensive floods retarded and curtailed spring sowings, and large-scale mobilisation, particularly in Rumania, led to a sizeable reduction of the winter grain acreage in most Danubian countries. To these handicaps must be added the effect of the territorial changes in Rumania. Bessarabia, now ceded to the Soviet Union, produced normally one-fifth of the Rumanian wheat and corn crops, and three-fourths of the oilseeds. The wheat loss this year will be even more serious, since the arid region of Bessarabia enjoyed favourable crop conditions, whereas crops in the rest of Rumania were short.

A Big Gap

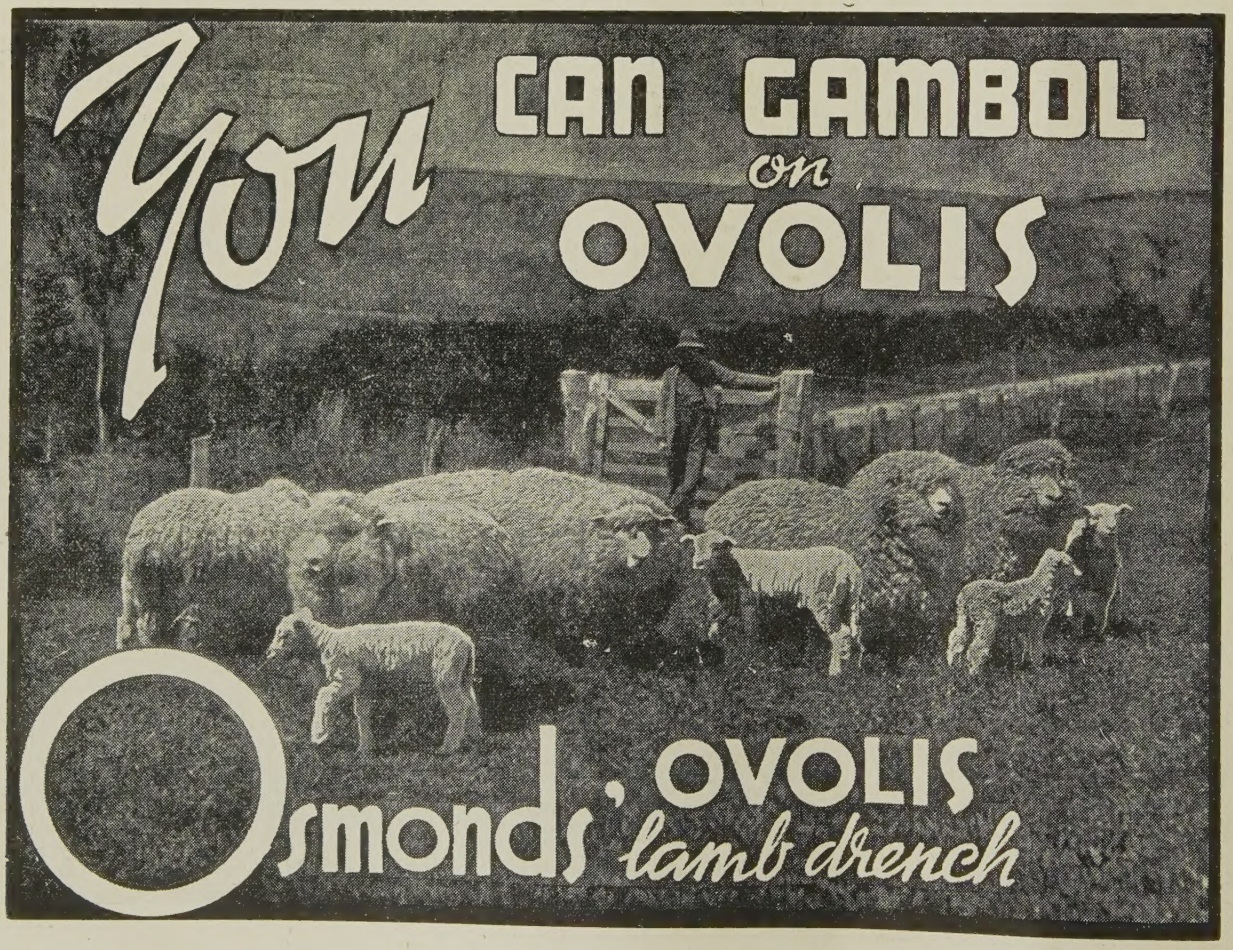
Unless the Danubian countries are deprived, by pressure, of part of their own urgent requirements, the total Danubian exports of wheat will hardly exceed 10 million bushels, and those of corn 25 million bushels. This compares with pre-war imports by deficit Europe of 170 million bushels of wheat and 190 million bushels of corn. The 1940-41 Danubian wheat exports will thus amount to only one-sixth, and those of corn to two-thirds, of the 1935-1939 exports. They will meet only 30 per cent. of the pre-war European and 40 per cent. of the Greater German wheat imports, and only 6 per cent. of the European and 13 per cent. of the German pre-war corn imports.

On the basis of detailed analysis of the social and economic structure of the Danubian countries, it is believed that there is little likelihood of an expansion in farm production in the next few years. In some of the countries, peculiarities of peasants' attitudes, racial habits, and a high degree of illiteracy make it improbable that educational methods could accomplish production expansion in a few years, since traditions and customs are likely to interfere with adoption of new modes of living and progressive farming methods. The uneconomic size of the farm holdings in Rumania, Bulgaria, and Yugoslavia remains another serious difficulty hampering rapid improvements in farm conditions.

Only a slow process of intensifying the agriculture of these regions holds out hope for future expansion of production. Even then it is doubtful whether such a process can be carried out without accompanying improvements in the standard of living of the peasants, a factor that would reduce potential export surpluses.

Ammunition for Destroying Wild Pigs

BY a misprint in the March issue the cost of ammunition for destroying wild pigs was quoted as 2/- per 100 rounds. This should have read: 22/- per 100 rounds.



THE Director-General's PAGE

Deleterious Wool Branding Fluids

REFERENCE was made last November to a trial of all the commercial wool-branding materials which was being carried out by the Livestock Division. This trial is still under way and is now nearing completion, and it is hoped to have definite results available in the next two or three months.

Tests are being made of both the lasting qualities of the various substances in the fleece and their ability to be completely removed in the scouring process. The former characteristic is, of course, the one which is mainly of interest to the farmer, but the necessity for complete and easy removal during the scouring process is of great importance to the manufacturer, as any branding material left in the wool may cause expensive and often irreparable damage to the textile product.

Rough and ready tests are useless in determining "scourability," and the Department has therefore installed a miniature scouring plant, with which it is possible to duplicate on a small scale the exact working conditions of a full-sized commercial plant. This experimental unit has already proved its worth, and will be useful in other ways in addition to the trial at present in progress.

The Fruit Crops

CROP estimates received from District Supervisors for both apples and pears for the month ended February 28 indicates a slight increase over the January estimates.

The harvesting season is about a week in advance of last year, and abundant supplies of Cox's Orange Pippin apples are now reaching the market. Jonathan and Delicious apples are now also being harvested, the colour and quality being equal to those of the previous season.

Canterbury orchards experienced a heavy gale during the month which resulted in the loss of approximately 23,000 bushels of apples and pears. This loss, in addition to that suffered as a result of a severe hail storm earlier in the season, has come as a heavy blow to many growers.

The stone fruit crop is now disposed of, with the exception of a small quantity of late peaches. The harvest in most districts was comparatively light, except in the Hawke's Bay area, which harvested a fair average crop.

Prices for stone fruits have been very high as a result of the shortage.

The Honey Crop

EARLY reports received from field officers from all parts of New Zealand indicated that weather conditions were good, and that the bees were making excellent progress in preparation for the main honey flow. With one or two exceptions, notably North Canterbury and South Auckland districts, the weather continued to be favourable. Consequently, the total crop of honey produced in New Zealand this season will be above last year's output.

The work of classifying and grading all honey sent to the central packing depot provided by the Government for the voluntary use of beekeepers is proceeding smoothly. Investigations are also being undertaken to assist beekeepers to overcome noticeable defects in certain honeys submitted for grading. Particular attention is being given to the hygroscopic nature of certain honeys, and samples taken at four stages of the production in three separate districts are being tested.

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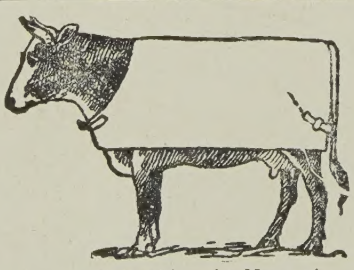

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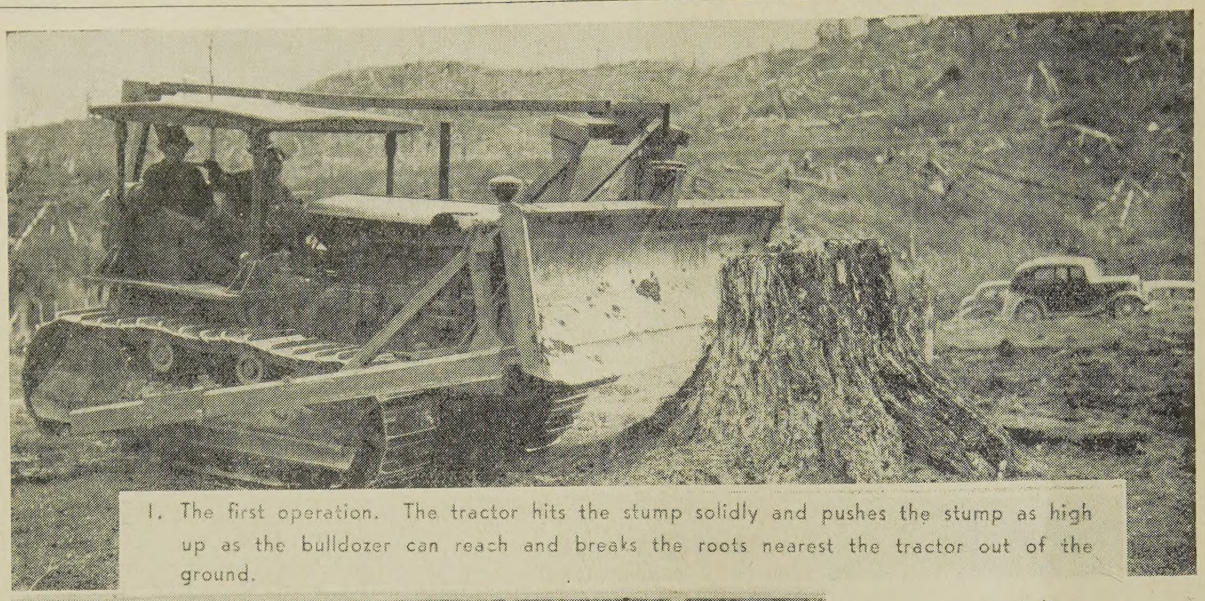
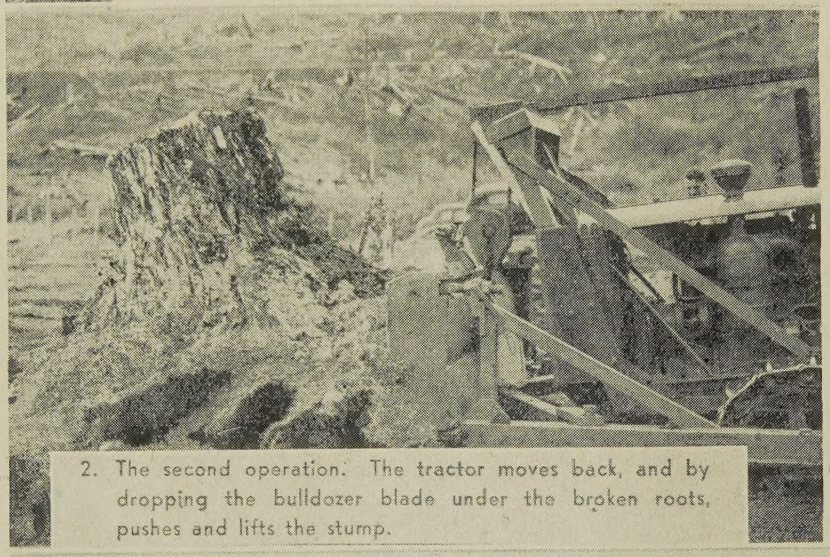
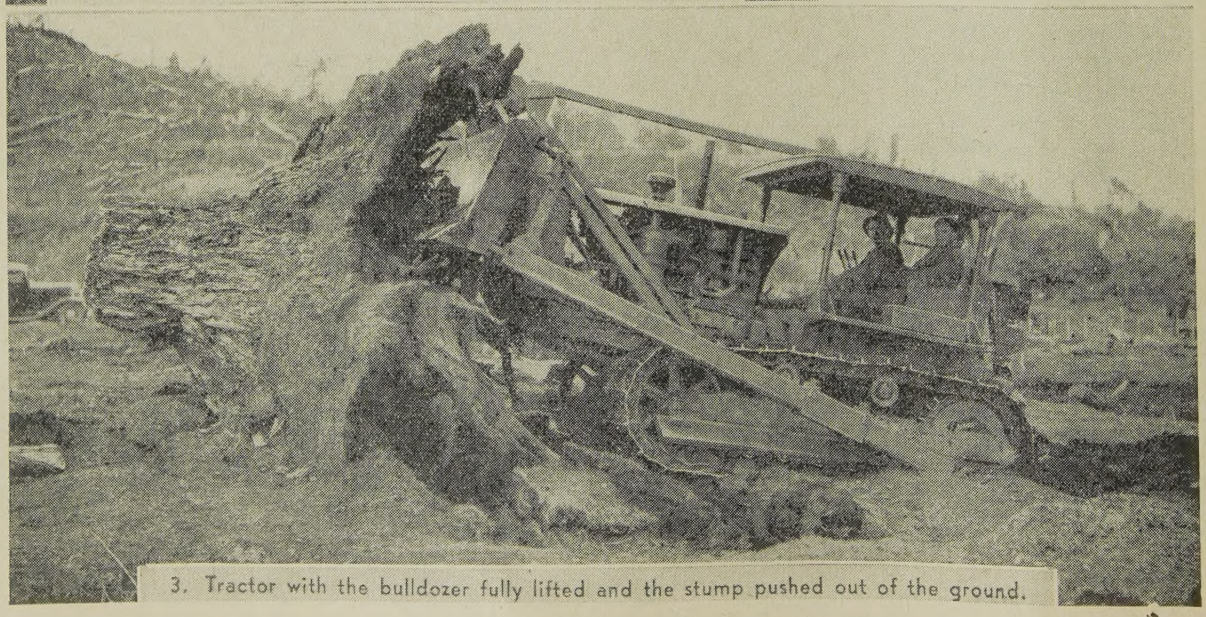


1. The first operation. The tractor hits the stump solidly and pushes the stump as high up as the bulldozer can reach and breaks the roots nearest the tractor out of the ground.



2. The second operation. The tractor moves back, and by dropping the bulldozer blade under the broken roots, pushes and lifts the stump.

— By —
W. T. BROWN,
Fields Instructor,
Taumarunui.



3. Tractor with the bulldozer fully lifted and the stump pushed out of the ground.

STUMPING WITH TRACTORS

FARMERS and contractors who have tractors or who intend stumping or logging with tractors will find interest in the following series of photos showing the various operations involved in shifting a stump.

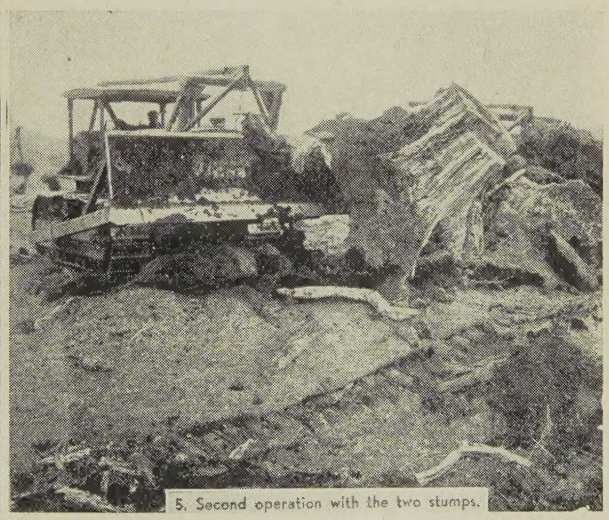
Before beginning operations on a block of stumps it is wise to find out from which direction the prevailing wind comes, as it is on this side that the tree is better rooted. If the tractors work at right angles to the heavy roots or in the opposite direction to the wind, it will be found that the stumps are removed much easier.

In the following photos, to give some idea of the size of machines and tractors, the single stump is 4 ft. across the top, and the blade of the bulldozer is 4 ft. 6 in. high.

All photos are by H. Drake.

6. The final operation. Clearing a stump off the area.

4. The first operation with two tractors working on two intertwined stumps.



5. Second operation with the two stumps.

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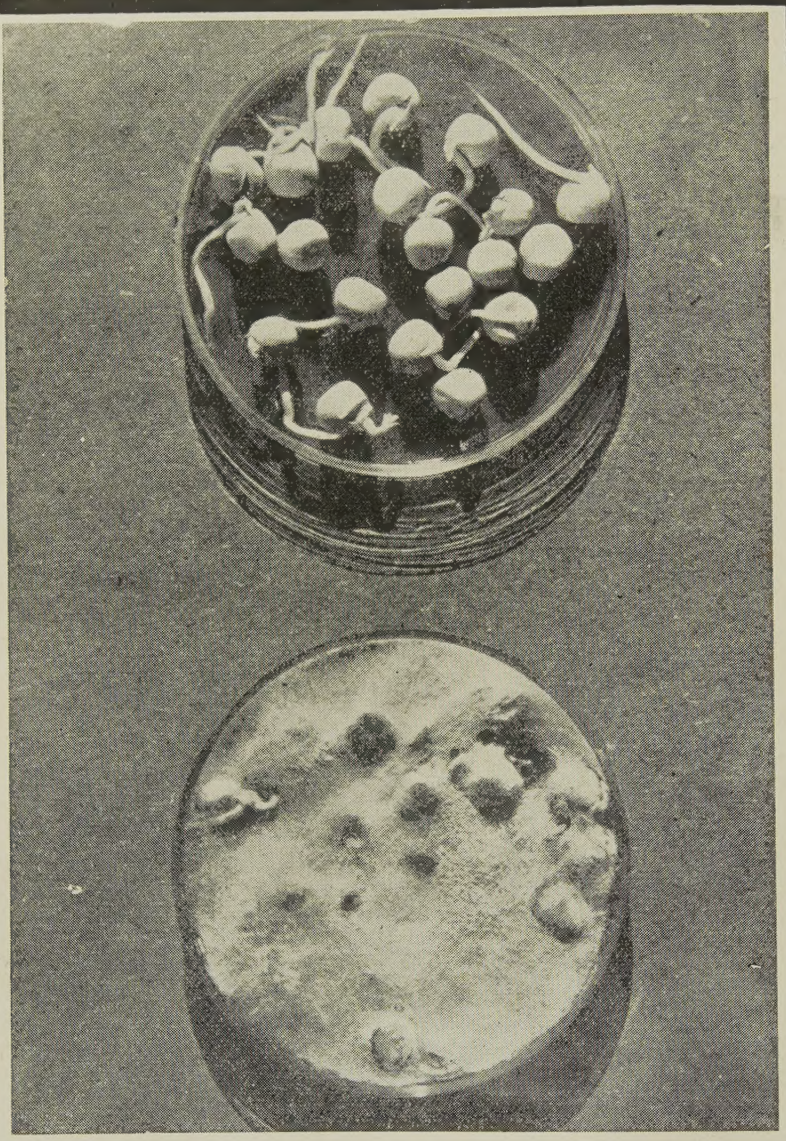

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New Zealand-grown Turnip and Swede Seeds Will Replace Overseas Supplies

By

J. H. CLARIDGE, Seed Certification Officer, Wellington, and

J. O. WALLACE, Fields Instructor, Dunedin.

Top. — A heavy seed crop of turnips grown in the Mossburn district.

Middle.—An ideal crop of swede seed which yielded well over half a ton of seed per acre.

WHILE most, if not all, farmers realise the great value in any farming programme of adequate supplies of turnips and swedes, very few have given any consideration to the source of supply of the seed from which these crops are grown. This is only natural, as New Zealand has relied in the past on English sources for seed supply. Importing merchants have seen that sufficient seeds have been brought into the country, and farmers have had no cause to interest themselves in this aspect of farming.

Today an entirely different position exists. Great Britain has been forced seriously to restrict, if not altogether prohibit, her exports of these seeds, and we have of necessity turned to our own resources in an endeavour to protect the production of this very important fodder crop.

Effect of War

With the outbreak of war, arrangements were made, purely as a safeguard, for the production in the 1940/41 harvest of seed from 200 acres of turnips and swedes. Nine months later it was learned that the safeguard was a dire necessity, and that New Zealand must look within itself for all the turnip and swede seed it could produce. A campaign was launched immediately, and as a result a further 400 acres of turnips and swedes—mostly surplus crops—were reserved for seed production this harvest. The whole area of 600 acres was examined carefully, both while the bulbs were over-wintering and also while the crops were in full flower, and all foreign and off-type plants were removed. The seed saved from these crops will be distributed throughout the trade by one mercantile firm, and will be sold under Government approval, so that farmers will be able to purchase supplies from their usual merchants.

An inspection of areas for seed purposes is made, not only during the winter when the crops are in the bulb stage, but also as shown here, when the crops are flowering. Impurities in the crop can be recognised at both stages.

With a longer period in which to make plans for seed production in the 1941-42 season, it has been found pos-

sible to arrange for the sowing of 1,500 acres specifically for seed production. The produce of this acreage will be sufficient to make this country self-supporting in turnip and swede seeds.

The future of this work is indefinite. Whether, after the war, we shall revert to our previous sources of supply, or whether we shall continue to produce our own stocks of seed is a question only time can answer. In the meantime, the work is being viewed purely as arising out of war conditions, but at the same time the planning for seed production is based on scientific principles which will enable the industry, if need be, to be established on a permanent basis.

Varieties

To the average farmer one very important feature of the production within this country of turnip and swede seeds should be emphasised. The various seed-growing firms in Great Britain have supplied turnip and swede seeds to this country under a long list of varietal names. There are, however, three main groups which cover all varieties: White Fleshed Turnips, Yellow Fleshed Turnips and Swedes. Within these groups are a number of types which for local purposes can be limited to about a dozen. Within these types again come a number of strains, some indistinguishable from others of the same type, others quite distinct yet sufficiently similar to be classed together.*

It is manifestly impossible at this stage to produce seeds of each of the varieties marketed locally in recent years; thus the alternative remained of selecting sufficient types to cover the general needs of this country and of producing seeds of these various types. The following list sets out the nomenclature under which it is proposed that New Zealand-grown turnip and swede seed will be sold, and also indicates the more important varieties represented by these types:—

DESCRIPTION OF TYPE.	VARIETIES REPRESENTED BY TYPE.
(1) White Fleshed Turnips.	
N.Z. Green Globe	Hardy Green Globe. Imperial Green Globe.
N.Z. Red Globe	Lincolnshire Red. Red Paragon.
N.Z. Purple Globe	Purple Top Mammoth.
(2) Yellow Fleshed Turnips.	
N.Z. Green Top Yellow	Green Top Yellow Aberdeen. Green Top Scotch. Fosterton Hybrid. Dale's Hybrid.
N.Z. Purple Top Yellow	Purple Top Yellow Aberdeen. Purple Top Scotch. Waites Eclipse.
N.Z. Green Resistant	Wallace.
N.Z. Purple Resistant	Bruce. Wonowon.
(3) Swedes.	
N.Z. Superlative	Superlative. Masterpiece. Success.
N.Z. Grandmaster	Grandmaster. Majestic. Tipperary.
N.Z. Crimson King	Crimson King. Elephant. Monarch.
N.Z. Resistant	Wilhelmsburger Otofte. Green Top.
N.Z. Sensation	Vilmorin. Sensation.

Note: Of the above, there will be no seed of the following harvested this season: Green Resistant, Sensation.

Value of List

The above list should prove of value to farmers in deciding what variety or varieties of New Zealand-grown turnip and swede seeds they should buy in the coming season. It is by no means complete, omitting as it does a number of minor varieties, but the majority of farmers will find recorded under one or other of the various descriptions the varieties they have been in the habit of growing. In order that promising material available by way of newer varieties may not be overlooked, selections are also being made within the varieties for comparison with the standard lines mentioned above. By this means it will be possible to include for seed production any varieties other than the standard lines which merit further consideration.

Some difficulty may be experienced this year in obtaining supplies of some of the types of seeds mentioned. This is only to be expected in the initial stages of a scheme of production such as that under consideration, and it may be necessary for farmers to make some selection alternative to their first preference. It is fully expected, however, with the wider range of acreage and better balanced proportions of varieties being grown for seed production in the 1941-42 harvest, that this difficulty will be purely temporary.

Certainly, if the results obtained in the past with New Zealand-grown turnip and swede seed can be taken as any criterion, farmers need have no cause for concern regarding the quality of the seeds now being produced.

* Readers interested in this aspect of turnip and swede varieties are recommended to read the findings of Hadfield and Calder, published in the "Journal of Agriculture" for September, October and November, 1935

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Tainted feed may cost the dairy farmer hundreds of pounds in a reduced payout. Much of the trouble may be avoided by

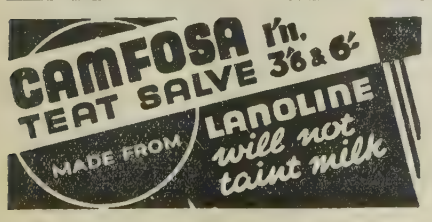
WATCH QUALITY IN YOUR DAIRY PRODUCE

controlled grazing to avoid weeds, but attention must also be paid to the causes of infestation of offensive weeds and appropriate steps taken.

By C. WALKER,
Instructor in Agriculture,
Thames.

NOW more than ever the dairy farmer must pay close attention to the maintenance, and even the improvement, of quality in the raw materials which are produced on the farm. The standard of shed hygiene, and the advisory service available, preclude any probability of weakness in producing high quality materials once the milk has been drawn from the herd, but there still exists a very definite obstacle to quality production in the materials that a herd is called upon to consume.

When eaten by stock, materials of an offensive nature have a very important bearing on quality, and it has been shown that, in certain circumstances, loss of quality cannot be overcome by subsequent treatment.



In late winter, during spring, and even into early summer the chief cause of deterioration in quality is the consumption of tainted foodstuffs, such as musty hay, certain roots, and taint-producing weeds. So far as bad hay and roots are concerned, the cause can be quickly eliminated by removing such hay and roots from the diet of the herd. This alone is all that is necessary to rectify the position.

Where weeds in pasture are causing the trouble, the remedy is by no means so simple. Such plants as twin-cress, penny-royal, hedge mustard, and stinking chamomile may be fairly evenly distributed throughout all fields on the farm, thus making it quite impossible to avoid fields where these weeds occur. Again, on other farms the position may be somewhat better in that only a few fields will contain any quantity of weed.

Controlled Grazing

The most satisfactory remedy where taint troubles are being experienced is to practise controlled grazing of the fields which are affected. Experimental work conducted over the past decade has shown that where herds have been removed from taint-infested fields at least three hours before milking, the produce would show no effects of any material consumed. This certainly involves a certain amount of work in shifting stock at midday from a tainted area to one where no troublesome weeds are growing, but, when one takes into account that this may mean the difference in returns between superfine and second-grade prices, I think the average farmer will appreciate the value of such work.

On farms where there are no fields free from tainting weeds it will even be necessary to go so far as to yard stock from midday until the afternoon milking. At first thought this will appear drastic, but, provided there is

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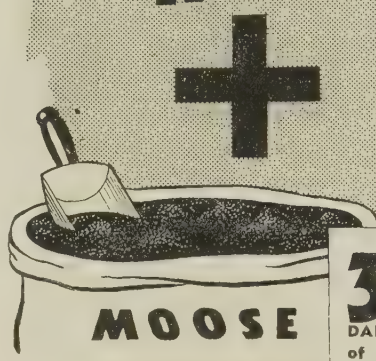

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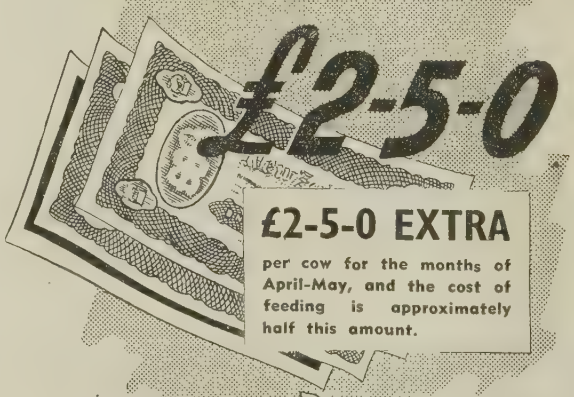

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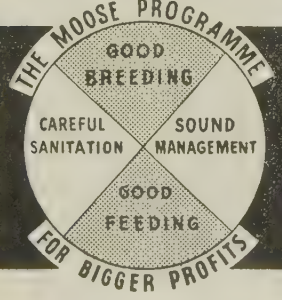

MOOSE

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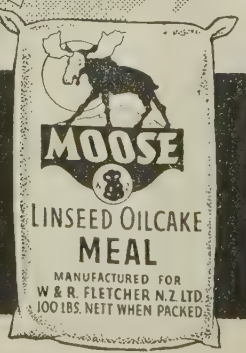

Fig. 1.—Typical spring-sown pasture illustrating the openness of the sward. In bare patches weeds have no difficulty in establishing.

Fig. 2.—Another spring-sown pasture in which far too much red clover was included. Note the open sward as it appeared eight months later. Grasses have failed to establish.

Fig. 3.—A sward established mainly from ryegrasses and white clover. Complete coverage is obtained in a few months.

good growth in the field so that the stock can gather their food quickly, no appreciable reduction in yield will occur. Certainly, the better payout for such produce will compensate the farmer quite handsomely for the slightly greater yield at second grade rates that might result from continuous grazing.

The average producer will immediately be saying, "Yes, that is all very well for the afternoon milking, but what about changing the herd over at midnight?"

Fortunately, this difficulty does not arise, as observations of herd habits show that cows on good pasture do not graze after 1 a.m. From that time until the morning milking they usually rest, and so comply with the requirements for taint elimination. However, farmers with a few clean fields may make doubly certain by grazing such fields only at night, and using the tainted areas for herd grazing after the morning's milking.

Again, on some farms the great majority of fields may be free from such weeds, and only one or two recently cropped areas may be affected. Obviously, if these can be eliminated from the area required for the herd, such action should be taken. Dry cattle, horses, or sheep may be used in their control.

Causes of Infestation

So far, I have merely indicated a means of overcoming a position where weeds of an offensive nature have become established. Let us now consider the causes of such infestation and what steps may be taken to avoid it.

In general, these weeds obtain access through breaking the sward by winter poaching of the land, by cropping, and by the sowing of poor grass mixtures. In parts of the Bay of Plenty and on the Hauraki Plains poaching undoubtedly provides excellent opportunities for weed invasion, and the position cannot be rectified very easily. Perhaps the most satisfactory procedure is to get stock away for a period while the land is very wet, but this is not always practicable.

Cropping also provides opportunities of infestation, not because cropping is wrong in principle, but chiefly through the inefficient cultivation of the crops followed by the sowing of poor grass mixtures.

By the term "poor grass mixtures" I do not wish to infer that poor strains alone are the cause, although, undoubtedly they are a major one, but a mixture may be unsuitable for other reasons. Chief of these, perhaps, would be its inability to produce a close sward very rapidly, a requirement which is of vital importance in competing with invading weeds. It is occasionally found that mixtures contain a dozen or so species, few of which are of rapid sward-forming type. While all may be very desirable in the ultimate sward, it is essential to sow a mixture in which the dominant species will establish quickly. Thus, on most soils perennial ryegrass, associated with a clover that establishes freely, should form the foundation of the mixture. Generally, white clover should be the associate plant, but, on the Hauraki Plains, strawberry clover will be more effective.

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Experimental work suggests that simpler mixtures of the perennial ryegrass-white clover-paspalum type are most effective in combating tainting weeds than the diverse mixtures of a dozen or more species. The advantages of the former lie in their ability to cover the ground quickly with a close, dense turf, while the latter remain open and thus allow weeds to flourish.

In addition to the sowing of simpler mixtures it will be found an advantage to sow a little heavier dressings, particularly for spring sowings. These enable denser coverings to be obtained in the early stages.

Manuring also plays an important part in reducing weed infestation. Heavy dressings of phosphate, and lime where required, will tend to speed up pasture development.

Spring Sowings

I have just mentioned that spring-sown grass mixtures could be sown a little heavier. From this I do not want farmers to infer that spring sowings will always be successful. On the contrary, the great weight of evidence gathered from farmers' experience and experimental work strongly emphasises the fact that much of the difficulty arising out of stock consuming tainting weeds occurs directly as a result of farmers practising spring sowings. Associated with this practice one frequently finds hurried cultivation, somewhat unsuitable grass mixtures, inadequate seeding, and insufficient manuring. Consequently, the young pasture begins under adverse conditions, the sward remains open, and vigorous tainting weeds become established, with disastrous results to the quality of dairy produce.

Nevertheless, circumstances occasionally demand spring sowings. This occurs chiefly after winter maturing crops, when the land would otherwise remain idle until the following autumn. It is in such instances that the recommendations of heavier sowings and better manuring are made.

Summary

To sum up the position for those who suffer losses through reduced gradings, one might make the following points:—

(1) Where tainting weeds—and an excess of clover could be included in this category—are restricted to a few fields, endeavour to graze such areas with dry stock only.

(2) If the herd must have access to such areas practise controlled daylight grazing by removing the herd to a taint-free area at midday each day. If possible, place the herd in a clean field after the evening milking.

(3) So far as possible, avoid spring sowings. By early autumn sowing, a good sward will establish before much weed shows up.

(4) Sow only good sward-formers, and only species that will establish rapidly. Ryegrasses, white clover, and paspalum should predominate where climatic conditions are favourable.

(5) Sow heavier seed mixtures and be more liberal with fertiliser.

(6) Do not graze spring sowings with dairy cows. Reserve these for dry cattle.

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THE WILD PIG MENACE

Experiments undertaken by the Livestock Division in the King Country have yielded promising results in combating the wild pig menace by poisoned bait. The most success attended the use of phosphorus poison, and the comments of the farmers on whose properties the experiments were undertaken indicate that the results were, with one exception, quite satisfactory.

By
G. R. MACKINTOSH,
Inspector, Livestock Division, Taumarunui.

Poisoning With Phosphorus Gives Promising Results

LOSSES amounting to many thousands of pounds are caused annually in many parts of New Zealand by the wild pig. It is difficult for one who has little knowledge of the wild pig to realise the enormous amount of damage caused by it. Hundreds—if not thousands—of acres of good hill pasture are annually rooted up as if the land had been thoroughly ploughed.

It is probably safe to say that the wild pig in its search for worms prefers to root pasture—particularly where white clover exists—rather than root up the fern. Apart from the immediate loss of the pasture in such instances, there is a degree of permanent loss because of the subsequent growth of bidi-bidi which almost inevitably grows on such rooted areas unless the area is sown with grass seed, but even when sown with grass seed the resulting sward of grass is never as good as formerly.

Although the greatest loss is due to rooting, substantial losses result from lambs being killed during the lambing season, broken and insecure fences, time spent in hunting the pest to the detriment of other farm work and dogs lost or spoilt in hunting. The cost of fencing materials, seed, ammunition, etc., have to be sustained by the farmer and may often turn a profit into a loss.

Several Methods Tried

Several methods of dealing with the pest have been tried, but, in the main, the settler has had to patrol his bush boundaries from dawn to dark with a rifle and dogs. Strychnine poison in carcass and in root baits has been used by various sheep farmers with surprisingly little success. The wild pig does seem to have some degree of tolerance for this poison—in fact, many contend that strychnine will not kill a wild pig—but even if effective, many farmers are reluctant to use this poison because of the danger to their dogs. Traps and other contraptions, such as the fixing of a loaded rifle to a gap in a fence so that the pig will touch a thin wire attached to the rifle trigger and so shoot himself, have usually been successful, but these methods take up so much time that they are seldom used.

In recent years the pest has steadily increased in numbers, with a corresponding increase in the amount of damage done. One of the worst affected areas is the King Country, and in an endeavour to deal with the problem various poisoning experiments were undertaken on some of the most suitable farms by the Livestock Division of the Department of Agriculture.

These experiments were carried out in various parts of the Taumarunui, Kaitieke and Ohura Counties. The poisons experimented with were strychnine, phosphorus dissolved in carbon bisulphide, and phosphorised pollard. It was difficult to find a farmer who was agreeable to having strychnine used on his property, and eventually it was used on a bush block. Approximately ½ oz. strychnine was injected into a sheep carcass. This bait was visited three weeks later, but only a very small portion of the bait had been taken. No dead pigs were found, although tracks were clearly discernible, and as promising results

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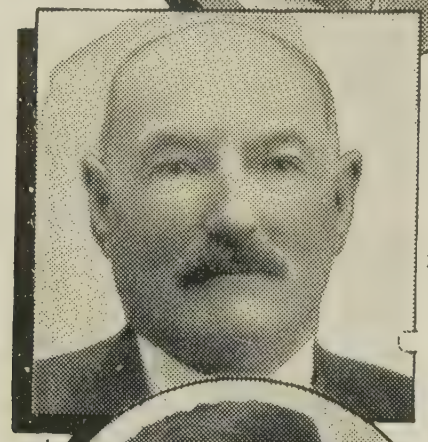

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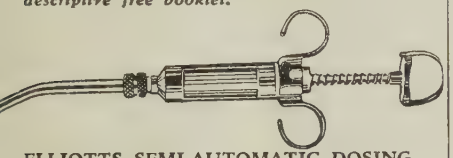

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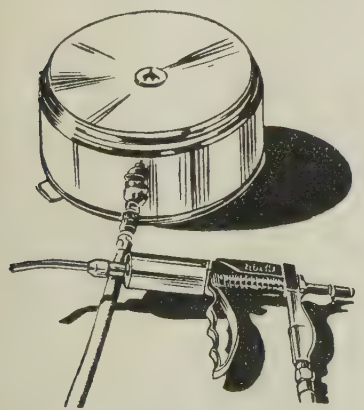

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were being obtained with phosphorus dissolved in carbon bisulphide, the strychnine experiment was discontinued.

Phosphorus Poison

The experiment with phosphorus poison was first carried out on Mr. W. B. Lacy's property at Whakahoro, Kaitieke County. Thanks to the generosity of Mr. Lacy, three rams and a hogget were killed, and into each carcass phorphorus dissolved in carbon bisulphide was injected with the aid of a 10 c.c. syringe. These carcass baits were laid on open grass areas of this run, over which pigs were known to roam. The pigs began to eat one ram carcass four days after it had been baited, and within three weeks all carcasses had been consumed. At first, two small pigs were found poisoned, but a later search disclosed seven dead in a clump of bracken fern about 300 yards from one of the baits and also other odd pigs dead, each in the vicinity of a carcass bait.

These experiments with phosphorus in carbon bisulphide were continued on this property and other neighbouring farms. Either a sheep was killed and poisoned, or where one was found dead as a result of being bogged or cast, or from other causes, the carcass was used as bait and the poison injected. Cattle carcasses were also used with fair results, but as the hide is much tougher than sheep skin, it was found that the pigs did not take quite so readily to such bait. Similar experiments were carried out on properties in the Taumarunui and Ohura Counties. In all, these trials were undertaken on eleven properties.

Mixing the Poison

The details of the method found most satisfactory are: In mixing the poison, pour approximately one pint of carbon bisulphide into a jug or other vessel, but care must be taken to keep any lighted cigarette, matches or any flames away, as this liquid is highly inflammable. Into the carbon bisulphide pour 3 to 4 oz. of water, and place five sticks of phosphorus into the jug containing the carbon bisulphide and water. The important point to remember in doing this is that the phosphorus stick must be allowed in the air only momentarily, as if it is kept out of the water for long it may "go on fire." See that the stick is thoroughly immersed in the liquid, and stir well until dissolved. Then pour the poison into a strong container. Do not store in a wooden building, as there is always the possibility, however remote, of the container being broken and the liquid eventually setting the wooden surroundings on fire. When carried on horseback, the container should be so carried that it may be easily discarded. Take care to avoid spilling the liquid on the clothes or hands. There is no danger in handling the poison if reasonable care is exercised, and the foregoing warnings are merely to acquaint the user of its inflammable properties. It will probably suit some farmers to have the poison prepared by a chemist.

Any animal carcass customarily eaten by the pest is suitable as bait. It will be found that the bait is usually preferred in a putrefactive state, for which reason a recently killed bait usually remains for some days before it is eaten. It does not appear to make much, if any, difference whether the bait is handled by human hands or otherwise, as the poison itself has a similar odour to that of decayed meat. If a cattle or horse carcass is used it is wise to remove the skin or cut it in several places so that the pigs can get at the flesh more easily.

The approximate quantity of poison to be injected into a sheep carcass is 2 oz., and into that of a cattle or horse carcass, 6 oz. to 9 oz. It is much better to allow the carcass to cool before injecting the poison. The syringe, preferably one with a fine needle, is first filled with the liquid poison, and then the needle is inserted into any part of the carcass and the poison forced in. The quantity of poison for each carcass should not be injected into one portion only, but in quantities of about ¼ oz. to 1-3 oz. into all parts of the fore and hind quarters, abdomen and lung cavity. At least eight injections should be made. If a drop of poison falls on the wool and a small flame appears, a little mud plastered on it will put it out.

Comments of Farmers

The following are comments of some of the owners on whose properties these trials were conducted:—

Mr. W. B. Lacy, of Owhango.—"Regarding the injection of carbon bisulphide into the carcass of a dead sheep as an effective means of killing wild pigs, I have much pleasure in stating and proving that it is practically 100 per cent. efficient. For 15 years I have been greatly troubled with the devils, I have shot them by hundreds every year. On several occasions I have lost

70 per cent. of lambs in the 'dangerous' paddocks, and, like many of my neighbours, I have had to patrol the back edges for weeks on end in trying to get those elusive old boars. This year I had no trouble at all, and have had a splendid lambing. I recommend this poisoning method to any farmer troubled with wild pigs."

Mr. E. J. Anderson, Ohura.—"In regard to the poison experiment, two sheep were killed and poisoned. A week elapsed before they were touched, then one carcass was cleaned up and the other about half. I later found 10 pigs, all dead, in the open bush, a thing I have not previously known in 30 years. I think many more were destroyed. I intend poisoning again, and feel sure that if others do likewise the pest would be greatly overcome."

Mr. J. Reg. Powell, Wanganui River.—"In connection with poisoning of wild pigs, the results were not very encouraging, probably due to the pigs being disturbed at time and place of poisoning. Of the ram and cattle carcass baits left in the bush, only the hindquarters of one beast were eaten. I certainly would not condemn this method of dealing with the wild pig—rather I think it has distinct possibilities, and I'm keen on further trials. I suggest that suitable unemployed men be employed to deal with the pigs by poisoning on abandoned lands."

Mr. Stan Wilson, Whakahoro.—"One wether carcass was poisoned, and 16 pigs were found to be killed for certain. I am of the opinion that there would be more in the 1,600 acres of bush adjoining my holding. Three of the pigs were still gasping when found, and could not get up on their feet. Seven of the sixteen were large boars. I poisoned two sheep carcasses on a neighbour's farm, and both were cleaned up. In my opinion, if farmers co-operated in poisoning and the Crown Land was done the menace would be greatly reduced."

Mr. James Dempsey, Lower Retaruke.—"In August two sheep were shorn, killed and poison injected. Both were completely eaten in a week, and the direct result was 22 dead pigs found, indirectly 12 (unborn). A bull was shot and poisoned and left in some fern scrub, and a month later the inside was eaten out. Time did not permit a search for dead pigs. Later in September three sheep found dead were plucked and poison injected. These were completely eaten in a fortnight, and the results were five dead pigs found nearby, probably more in scrub and fern. I believe a mistake was made in not skinning the bull carcass; my observations suggest that killed carcasses are better than ones found dead. In my opinion, poisoning should start in July, when grass is scarce and the pigs are looking for carcasses, and that to avoid reinfestation all farmers should poison at the same time. In conclusion, I state confidently that, provided the bonus is continued and systematic poisoning carried out on farms on abandoned country and reserves, the menace will be quickly overcome."

Mr. S. P. Wilson, Rauwhare.—"I would recommend the pig poisoning to anyone in an infested area. I lost approximately 100 lambs this year. I have stayed out until 1 a.m., other times rising at 4 a.m. when hunting for pigs during lambing. I had shot 20 pigs, mostly boars, before I used the poison in two sheep carcass baits, and with which I poisoned three large pigs and a sow which was doing all the killing. I am confident that if I had used the poison earlier I would have had a better lambing."

Satisfactory Results

As the comments of the owners on whose properties these experiments were undertaken indicate, the results obtained were, with one exception, quite satisfactory. All carcass baits were consumed, or partly so, and although in the vicinity of bush country, poisoned pigs were found.

In making examinations of dead pigs which were lying in the vicinity of the remains of poisoned baits the writer found indications of phosphorus poisoning. Similar evidence was also found by Mr. James Dempsey. However, in order to place the matter beyond doubt, the body of a half-grown boar which was found by Mr. Wilson on his top farm at Whakahoro and which had been poisoned was forwarded to Wallaceville Animal Research Station for examination and analysis of the stomach contents. Mr. L. Fitch, Chief Diagnostic Officer, confirmed that death was due to phosphorus poisoning. This, incidentally, also substantiated the claim of a Southland farmer who claimed to have used this poison successfully some years ago.

A phosphorised pollard poison trial was also carried out. Quantities of approximately 1-3 lb. of phosphorised pollard were laid on both sides of gaps

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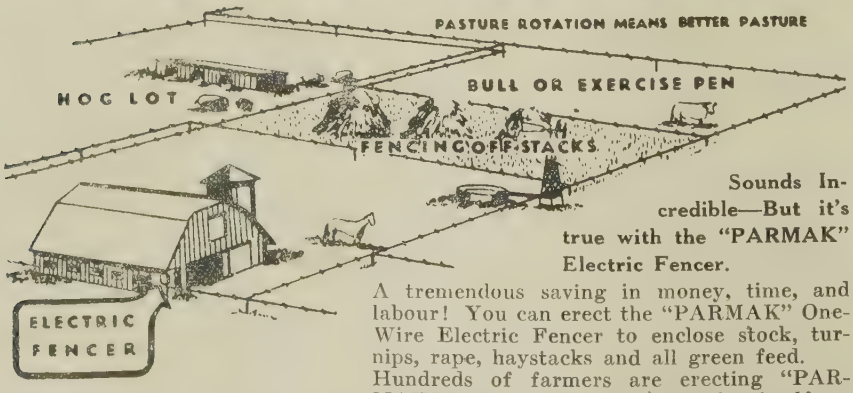

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in fences through which pigs frequently passed. Other small heaps were placed at intervals along pig tracks, and at each of these latter sites either carrots or turnips were also laid. When this locality was again visited a week later it was found that most of the heaps of phosphorised pollard had disappeared, and from the fresh pig tracks about each poison site and the fact that a marked diminution in the amount of pig rooting was evident, it appeared that the pigs had consumed the poison. The carrot and turnips remained untouched. Definite proof was not, however, obtained.

Mr. J. McLeod, of Kirikau, who used this poison in a similar manner some years ago, states that he found many poisoned pigs, five of which were lying, as if sleeping, under a punga tree. This latter method may be worthy of consideration where dogs which are accustomed to pollard can be kept under control, but is otherwise not as satisfactory as the method of injecting phosphorus into a carcass.

Protection of Dogs

If a dog consumes a portion of a carcass into which phosphorus has been injected it may be poisoned, but this poison is not so deadly for dogs as is strychnine. There is also the advantage that phosphorus disappears as the carcass bait decomposes.

Because of the roaming habits of the wild pig it is suggested that farmers in pig-infested areas should arrange for a concerted poisoning at a suitable time, such as during June or July. If, in certain circumstances, there is a danger of neighbouring dogs getting near the baits, dog owners could be warned to keep their dogs under control during that period. In extreme cases the baits could be laid on pig tracks in the bush, where dogs are unlikely to find them.

The importance of protecting the hill country from the depredations of the wild pig can be even more readily understood when one considers the large number of sheep which such districts yearly supply to the low country. The white-faced ewe with its constitution, frame and ability to do its lamb well is keenly sought after by the farmers who produce fat lambs. These poisoning experiments indicate that a resolute poisoning campaign about the native haunts of the wild pig would greatly assist in eliminating the scourge and in protecting an important productive asset.

Slaughterings of Stock

THE following returns of slaughterings of stock at meat-export slaughterhouses and abattoirs for the ten months, May-February, 1940-41, have been compiled by the Livestock Division:—

District	Cattle	Calves	Sheep	Of which Ewes were	Lambs	Swine
North Island						
Meat Export Slaughterhouses—						
Auckland	150,707	595,772	250,179	197,808	1,140,106	267,836
Poverty Bay-Hawkes Bay	56,497	57,562	500,259	305,631	1,241,859	23,916
Taranaki-Manawatu	76,990	219,353	323,742	239,094	1,184,726	145,457
Wairarapa-Wellington	34,846	30,742	274,127	173,604	852,720	34,279
Totals	319,040	903,429	1,348,307	916,137	4,419,411	471,488
Abattoirs	100,519	31,699	386,383	192,885	65,246	96,786
North Island Totals	419,559	935,128	1,734,690	1,109,022	4,484,657	568,274
South Island						
Meat Export Slaughterhouses—						
Nelson-Marlborough	1,454	10,042	43,333	20,665	159,802	9,067
Canterbury	10,569	42,288	418,999	358,930	1,665,940	29,241
Otago-Southland	7,733	39,468	230,765	197,905	1,969,231	6,195
Totals	19,756	91,798	693,097	577,500	3,794,973	44,503
Abattoirs	44,608	11,686	214,048	102,736	37,941	32,692
South Island Totals	64,364	103,484	907,145	680,236	3,832,914	77,195
Dominion						
Meat-expt. Slaughterhouses	338,796	995,227	2,041,404	1,493,637	8,214,384	515,991
Abattoirs	145,127	43,385	600,431	295,621	103,187	129,478
Grand Totals	483,923	1,038,612	2,641,835	1,789,258	8,317,571	645,469
Same Period, 1939-40— Meat Export Slaughterhouses and Abattoirs	407,145	1,027,998	2,477,657	1,348,247	7,418,803	529,920
Same Period, 1938-39— Meat Export Slaughterhouses and Abattoirs	397,787	990,559	2,480,316	1,269,954	7,431,793	674,705

Slaughterings of Pigs

The 100,687 pigs killed during February were distributed in weight ranges as follows:—

Under 60 lb.	298
61-110 lb.	24,627
111-120 lb.	10,631
121-160 lb.	41,160
161-180 lb.	12,732
Over 180 lb.	3,834
Sundry	7,405

The grading of porkers is 93 per cent. first quality and 7 per cent. second quality, and of baconers 74 per cent., 20 per cent. and 6 per cent. of prime 1's, prime 2's and second quality respectively.

In the different weight ranges of baconers, the grading is as follows:—

111-120 lb.	88%, 9%, 3% of P1, P2 and 2nd quality.
121-160 lb.	74%, 20%, 6% of P1, P2 and 2nd quality.
161-180 lb.	59%, 31%, 10% of P1, P2 and 2nd quality.

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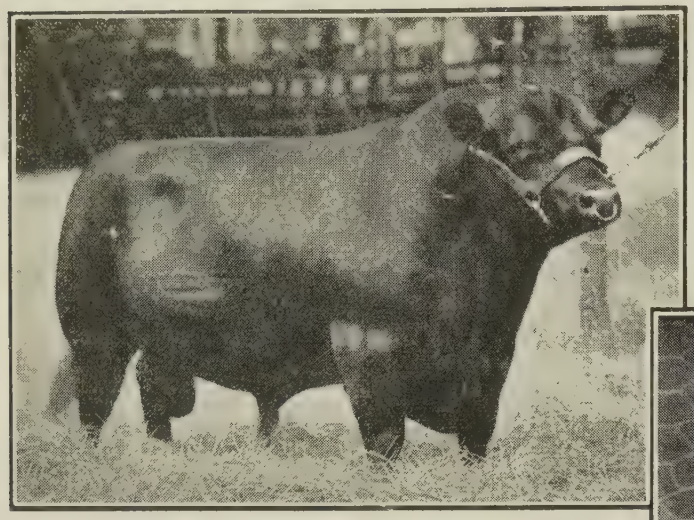

Above: BARMAR QUALITY (Imp.), the late herd sire of BEACHLEA DOWNS STUD. Before he left America he was Junior International Champion at Chicago.

Right: BEACHLEA D57, the chief sire of the Flock. He is a son of SANDRINGHAM 117/34 (Imp.), bred by H.M. the King. He won two gold medals as a shearling, and has won many championships.

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Bone Char	Calcium Phosphate	Molasses
Cobalt	Sulphate of Magnesia	

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How Your Milking Machine Works

The VACUUM GAUGE

By W. G. WHITTLESTON,
Animal Research Station,
Wallaceville.

CONTINUING the series of articles on the mechanics of the milking machine, this article discusses the vacuum gauge. Before dealing with the description and practical details of the common Bourdon type gauge, however, a few general principles must be given.

The most commonly used unit of vacuum is the inch of mercury. This is used because one of the most convenient methods of accurately measuring a negative pressure or vacuum is the mercury gauge. Sometimes the expression "so many pounds of vacuum" is used. This is a loose expression, normally intended to mean a vacuum of so many inches of mercury. If a vacuum is referred to in terms of pounds per square inch it is important to realise that a vacuum of 30 inches of mercury is approximately equivalent to 15 lb. per square inch.

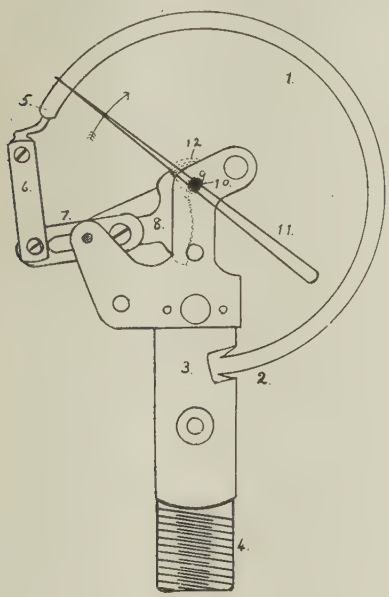

Fig. 1.—The construction of the Bourdon type vacuum gauge.

A common misunderstanding which should be cleared up is that a gauge which is set correctly at sea-level will be incorrect if transported to a place some height above sea-level. The actual atmospheric pressure obtaining at any place where a gauge is in use in no way affects the readings of that gauge except in so far as it sets the maximum vacuum to which the gauge may go. It certainly has no effect whatsoever on the accuracy of the gauge. Any vacuum gauge is essentially a device for measuring the difference between atmospheric pressure and that obtaining in a milking machine or any device operating at a pressure below that of the atmosphere.

The Bourdon Gauge

The most popular mechanical gauge for pressure and/or vacuum is the Bourdon patent gauge which is illustrated in Fig. 1. It consists of a curved tube (1) of eliptical cross-section closed at one end. The open end (2) is affixed to the block (3) which is integral with the threaded portion (4) by which the gauge is connected to the vacuum (or pressure) to be measured. The closed end (5) is free to move, and is connected by the link (6) to the lever (7), which is fixed by an adjustable mechanism in many gauges to the toothed sector (8). The latter engages a pinion (9) mounted

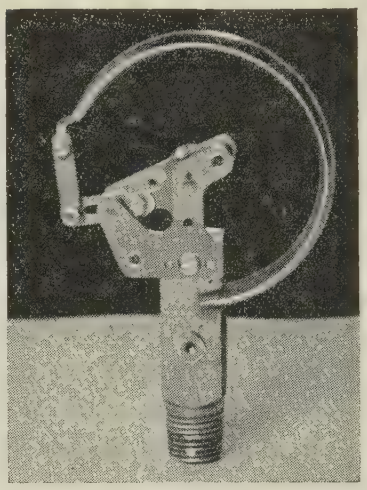

Fig. 2.—The mechanism of a typical modern vacuum gauge.

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on the shaft (10) carrying the hand (11). In most modern gauges a light hair-spring (12) applies a slight tension to the shaft (10), thus preventing the hand from wobbling due to play between the pinion (9) and the toothed sector (8). The mechanism of a typical modern vacuum gauge is shown in Fig. 2.

When a vacuum is applied to the gauge the curved tube (Bourdon tube) tends to curl inwards, thus causing the hand to rotate in the direction shown by the arrow in Fig. 1. The curling effect is proportional to the difference in pressure between the inside and outside surfaces of the Bourdon tube. In other words, the device measures the pressure difference between the system to which it is connected and the atmospheric pressure. In a pressure gauge the only difference is that the tube tends to straighten, and the mechanism is arranged for this direction of motion. The Bourdon tube is made of springy metal, and on the constancy of the elasticity of this metal depends the accuracy of the device.

For measurement of pressure the Bourdon gauge is capable of a fair degree of accuracy, particularly when the pressure is of a considerable order,

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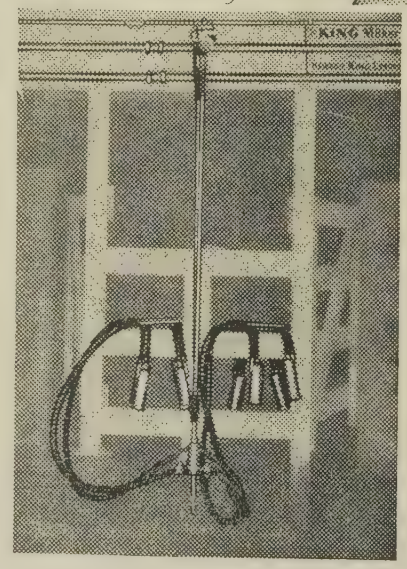

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but for the measurement of vacuum the device is not very accurate. The accuracy of any measuring device depends on the ratio between the force available to activate the mechanism and the friction encountered. Even with a vacuum of 30 inches of mercury the pressure is only 15 lb. per square inch—very small compared with that obtaining in an ordinary steam engine boiler (150-250 lb. per square inch). Hence, any friction in the mechanism will have a bad effect.

In particular, the chief sources of trouble in a Bourdon gauge on a milking machine are as follows:—

Corrosion of the Bourdon Tube

Because of the presence of milk spray and water vapour in the tubing on milking machinery, the interior of the Bourdon tube may become contaminated with substances which harden and corrode, so encrusting the tube that its elasticity is appreciably diminished. The result is that it requires a higher vacuum than is shown by a particular reading in order to move the hand to that point. The gauge then reads low, which is highly undesirable.

Because of the above facts and the related fact that any corrosion due to contamination of the interior of the gauge means the danger of undesirable substances finding their way into the machine, a gauge should never be placed on the milk pipe. It should be near the relief valve on the air line, or, in the case of a single pipe line machine, between the vacuum tank and the releaser, or on the vacuum tank.

Corrosion of the Moving Parts

As in a clock or any other relatively delicate mechanical system, so in a Bourdon gauge corrosion of the moving parts causes serious errors. The point has been made that the accuracy of a measuring instrument depends, among other things, on the ratio between the force available to move the mechanism and the force due to friction in the moving parts. Any corrosion will increase the friction in the mechanism and so decrease the sensitivity of the gauge. It is, therefore, highly desirable that the mechanism be enclosed in a case which is as nearly watertight as possible. From time to time the moving parts should be oiled with a light, non-gumming machine oil, which, as well as giving lubrication, will prevent corrosion.

Wearing of Rack And Pinion

In some milking machines the vacuum tends to fluctuate. This results in more or less constant movement of the mechanism, causing wear of the teeth of the rack and pinion, which will cause the hand to develop free play if a hair-spring is not used. Such play can produce quite large errors in reading. However, even when a hair-spring is used, wear of the teeth of the pinion and of the rack will cause small errors. An even more serious effect is the fact that worn teeth will slip more readily than new ones, and a sudden jolt to a worn gauge may produce a very large error due to the pinion slipping with respect to the rack. Another possible trouble arises if the teeth become so worn that they are easily deformed. A jolt, or even ordinary wear and tear, may then cause misshapen teeth, which will stick and make the gauge unreliable.

It is therefore necessary to see that the mechanism of a Bourdon vacuum gauge is made of hard wear-resisting metal, while the effects of wear can be considerably reduced if the gauge is placed on a part of the mechanism where the vacuum is fairly steady. The air line is a suitable place, but a gauge should not be placed near the pump unless suitable provision is made for damping-out variations. Such provision may be made by mounting the gauge on a short length (say about 8 in.) of 1½ in. or 2 in. tube which is connected to the machine through a fine hole 1-16 in. or 1-32 in. diameter (depending on the violence of the variations at the point). So mounted, a gauge will not respond to any but very marked variations in vacuum, and it will also give a true average reading. Care is required to keep the small hole clear. It is better, however, for the gauge to be mounted on a part of the machine where such provisions are not necessary.

Shifting of Hand On Spindle

It is common practice to secure the hand on a Bourdon gauge by hammering it on to a tapered spindle. Such a method of fitting can slip. The common practice of letting the vacuum go suddenly in order to clear the milk pipe at the end of milking causes the gauge hand to slam violently against the zero stop. Should the hand not fit its spindle tightly such treatment will cause it to move, causing the gauge to read too high. Bad errors of this kind may be evident, because the hand will not return to zero, but such need not be the case. In many makes of gauge the hand is held against the zero stop with a slight tension. Hence, a small vacuum must be applied before the hand will move. An error due to the hand slipping on the spindle will have to equal the vacuum required just to move the hand (sometimes 1 in. to 2

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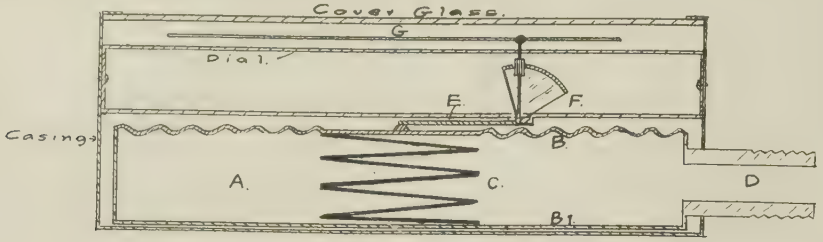

Fig. 3.—Section of a diaphragm type of vacuum gauge.

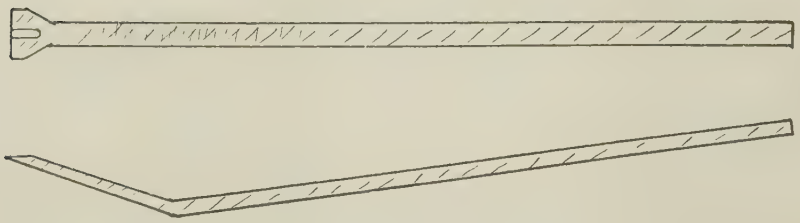

Fig. 4.—A simple tool for removing the hand from Bourdon vacuum gauges.

in.) before it will show as a zero error in which the hand does not return to the stop.

Errors arising from the practice of suddenly letting the vacuum in the machine drop may be prevented by the same method as that given above for "ironing out" fluctuations—that is, by inserting a small hole and a chamber of suitable capacity between the gauge and the machine.

As can be seen from the above, the Bourdon vacuum gauge is liable to become inaccurate through a variety of causes. It must be borne in mind that it is a relatively delicate device, and should be treated as one would treat a clock, cleaning and oiling it from time to time in order to offset the bad effects of life in a normal cowshed.

Other Types of Vacuum Gauge.

One other type of mechanical gauge which has possibilities and which has not as yet become widely known is that based on the same principle as the aneroid barometer (Fig. 3). In its simplest form it consists of a shallow cylinder (A.), one end of which (B) is made of flexible corrugated metal, the other end (B1) being rigid. The ends are kept apart by a spring (C), and the inside of the cylinder is connected by the tube (D) to the vacuum to be measured. One end of the cylinder (B1) is fixed to the framework of the instrument, while the flexible end is attached by its centre to a lever (E) and suitable gearing (F), which actuates the pointer (G).

The chief advantage of this type of gauge over the Bourdon type arises from the fact that the cylinder can be readily made of such dimensions that the force available to actuate the mechanism is considerable. For example, if the diameter of the flexible end is 3 inches and the vacuum inside the cylinder is 15 inches, the total force acting on the spring is approximately

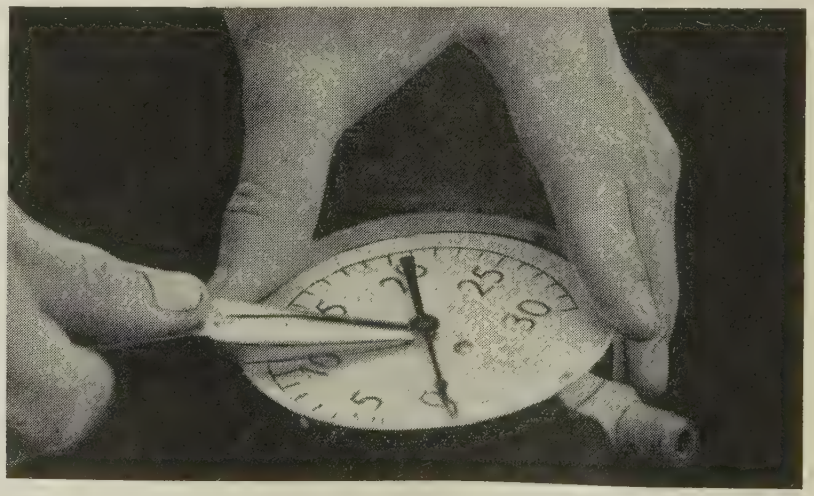

Fig. 5.—How to remove the hand of a Bourdon vacuum gauge.

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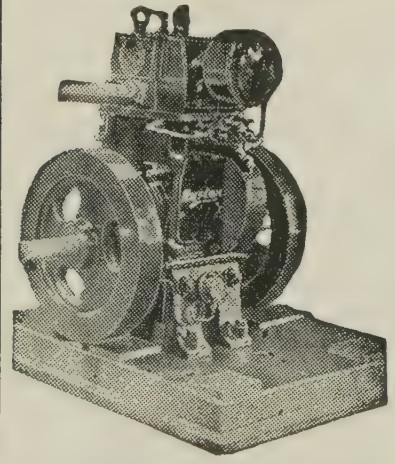

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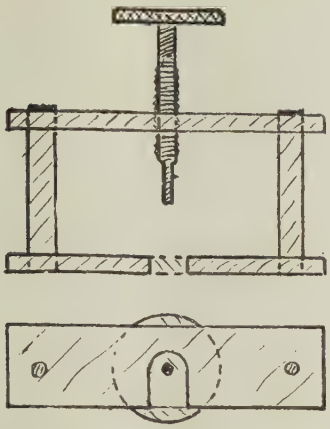

Fig. 6.—**A mechanism for safely removing the hand from a Bourdon type vacuum gauge.**

52½ lb. This force can be made to actuate a very robust mechanism without serious error due to friction. It is more costly to produce and is still open to this objection, that the inside of the cylinder will become corroded when the device is used on a milking machine. However, it is probable that in suitable form a gauge of this type would be more satisfactory in its general performance on a milking machine than present types.

The mercury gauge has been tried on milking machines, but the deposition of milk vapour and spray on the inside of the glass tube, together with bacterial growth, soon cause the glass to become so dirty that the mercury is not easily seen. A further objection is the fact that a glass tube is readily broken. It is also important to bear in mind the fact that a small amount of mercury coming in contact with a brass or copper pipe or fitting can do a lot of harm.

Hints on Care of Gauges.

It is sound practice to take the gauge off the machine and clean it once a year. Care is needed in removing the gauge from the machine, however, and in unscrewing the device it should not be gripped by the body and twisted as a whole if there is a square portion provided above the thread. The latter is provided so that a spanner can be used in screwing or unscrewing the gauge from its socket. Many gauges, however, do not have this provision, and are therefore supposed to be so constructed that the body will stand twisting. However, it is much better to use gauges which can be tightened in their sockets by means of a spanner, as all danger of twisting the mechanism is thereby eliminated.

The glass is removed by loosening or removing the screws holding the rim, but before the face is removed the hand must be taken off the spindle. This must be done in such a way that only a direct pull is applied to the spindle, and any tendency to bend it must be carefully avoided. A device such as that shown in Fig. (4) will be found useful. Alternatively, the hand may be pulled off directly with a pair of small pliers or levered off, using pliers as shown in Fig. (5). The ideal method is that shown in Fig. (6), which is similar to the method used by mechanics for removing pins from driving chains.

Oiling

Once the hand is removed the face may be taken off exposing the mechanism. Any accumulated dirt must be removed, for which purpose a small mohair brush is suitable. When clean, a drop of light oil (household lubricating or light separator oil) should be placed on all the bearings and on the rack and pinion (see Fig. 7). The device may then be reassembled and tested.

It should be borne in mind that once the hand has been removed the gauge must be put on a known vacuum

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before replacing. Merely putting it back so that it rests against the zero stop does not mean that it will read correctly. As previously mentioned, in many gauges the hand rests with slight pressure against the stop when it is reading correctly. Should the hand of such a gauge be replaced just touching the zero stop a considerable error may result. A further point to remember is that because of the effect of gravity on the mechanism, a gauge must be finally adjusted in its working position—that is, mounted vertically. If a gauge is adjusted while lying flat on its back it may be in considerable error when moved to a vertical position.

Some makes of gauge are provided with a removable back. Provided this makes a dust-proof connection with the body of the gauge, it is a very satisfactory arrangement, as it allows cleaning and oiling of the gauge without having to remove the hand.

One of the greatest deterrents to the regular testing and adjustment of vacuum gauges is the difficulty in removing and replacing the hand without harming the mechanism. The writer suggests the following simple device which enables the gauge to be adjusted within reasonable limits without removing the hand.

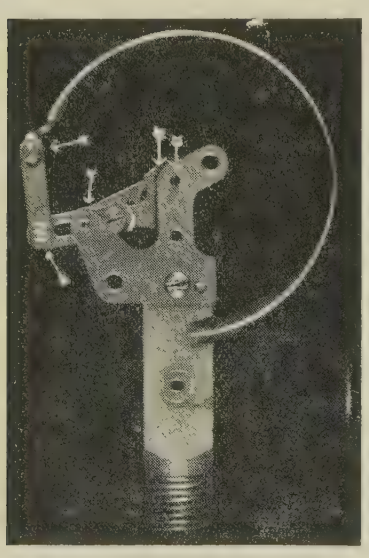


Fig. 7.—Where to oil a Bourdon gauge.

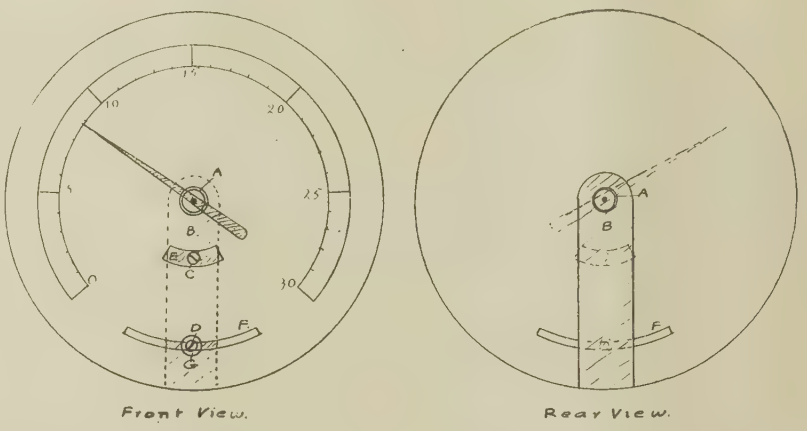


Fig. 8.—A simple adjustment mechanism for Bourdon type vacuum gauges.

Simple Device

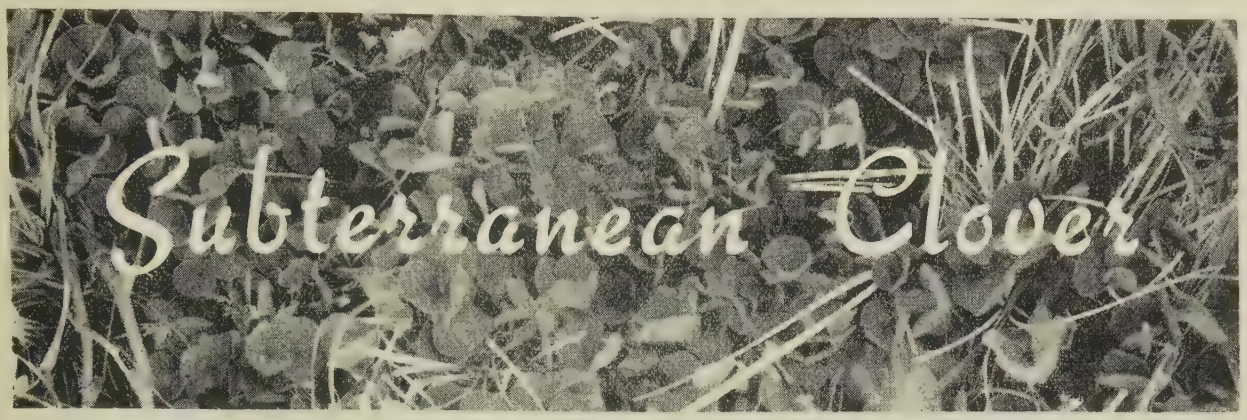
The face of the gauge is held by the hollow rivet (A) in the centre (see Fig. 8) to the strip (B) which is fixed to the gauge mechanism by the screws (C) and (D). A slot (E) is cut in the face to clear screw (C), while a narrow slot (F) is cut as shown so that screw (D) clamps the face firmly when tightened. A small washer (G) is employed between the slotted portion of the face and the head of the screw to make the tightening more secure. Adjustment is effected by loosening screw (D), moving the face so that the hand points to the correct reading, and retightening (D). This device may easily be made in such a way that the glass need not be removed. As danger of tampering by unauthorised persons is thereby increased, the present arrangement is preferred by the writer.

When the above device is employed on a gauge with a removable back we have a type of construction which renders both adjustment and cleaning as simple as possible. As the device is not patented, it may be employed in the construction of any gauge, thereby removing the danger of upsetting the mechanism when removing the hand, and greatly facilitating adjustment.

A mercury gauge suitable for the setting and testing of Bourdon vacuum gauges has been described in the June, 1940, issue of the "Journal of Agriculture."

Acknowledgment

The writer wishes to acknowledge the valuable assistance given by Mr. A. Bryant, who has taken the photographs illustrating this and the two previous articles.



For the last four years Instructors in Agriculture in the southern half of the North Island have established many experimental sowings of subterranean clover on the main soil types and under varied conditions. As a result, much accurate knowledge is now available of the possibilities of subterranean clover, and a series of articles will be published in the "Journal" by the Instructors who carried out the trials.

EXPERIMENTAL SOWINGS IN THE NORTH ISLAND

By C. J. HAMBLYN,
Fields Superintendent,
Palmerston North.

AN article on subterranean clover in the North Island was published in the January, 1937, issue of the "Journal of Agriculture." In this article a brief review of the possibilities of this clover under various conditions of soil and climate was given, as well as a general description of the plant and some details of the special features and value of subterranean clover as a pasture plant. In the February issue of the same year various strains of subterranean clover were discussed fully and an indication given of the importance of some of the differences to be found in various strains.

During the past four years the Instructors in Agriculture in the southern half of the North Island (including the provinces of Taranaki, Wellington, Hawke's Bay and Poverty Bay) have established upwards of 100 experimental sowings of subterranean clover on all the main soil types in their districts and under varied climatic and farming conditions. These experimental areas have been kept under close observation, and accurate records have been made of the results obtained with each trial. During these same four years the experience of farmers with subterranean clover, whether good or bad, has been studied.

Instructors in the districts referred to have now available for the information of farmers a considerable amount of accurate and tested knowledge as to the possibilities of subterranean clover in any given set of circumstances. They have information on the types of soil and climatic conditions where subterranean clover will do well. They also have definite information as to the conditions where it is not advisable to sow subterranean clover, or where other types of clover, particularly white clover, should be depended on to give better results.

The experimental sowings have been made on unploughable hill country, where surface sowing is the only means of introducing this and other clovers, and also on ploughable land of all types in pure sowings and in mixtures. In both cases very useful information has been gained on such points as the best time to sow, the seeding required to give good establishment, the best condition of the turf for successful surface sowing, the best strain of those available, the type of management required to give good re-establishment, and the rate at which soil fertility is built up under different soil and climatic conditions so that other species, such as rye and white clover, will thrive, etc.

Some very valuable information has also been obtained as to those districts in which there is little or no place for subterranean clover, as this plant is difficult to establish, and is dominated by the other grass and clover species when topdressed. This is the position in many of the high rainfall areas of the west coast and inland districts, and such knowledge should save farmers from useless expense.

This brief article is intended as an introduction to a series of articles in subsequent issues of the "Journal" by the Instructors who have carried out the trials and made observations on farms in their districts. In each of the articles an authoritative and up-to-date statement of the place of subterranean clover, if any, in the improvement of pasture will be given, and the advice should prove of considerable value to the farming community in the various districts, which will include North, Central and Southern Taranaki, Wanganui and Rangitikei, Manawatu, Horowhenua, Wairarapa, Southern, Central, and Northern Hawke's Bay and Poverty Bay.

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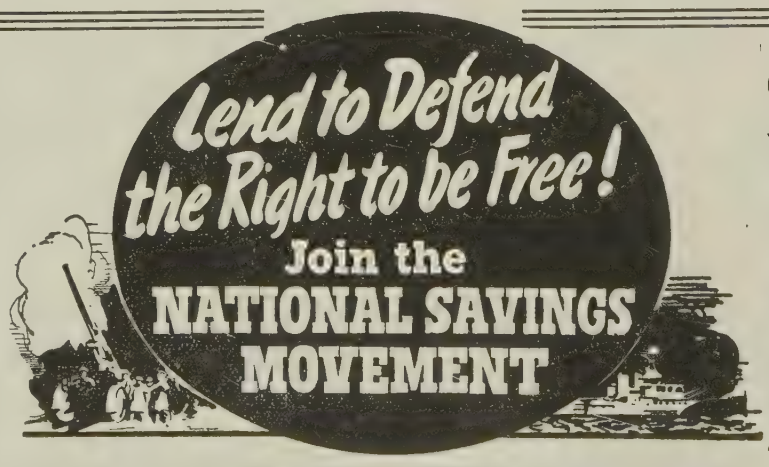

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There's a Place for Sub. Clover In Parts of the Wairarapa

— By —
N. LAMONT,
Instructor in Agriculture,
Masterton.

SOME imaginative people can visualise a time when topdressing of inaccessible hill country will be done by aeroplane under a huge co-operative scheme. While it might perhaps be a little rash to endorse such a prophecy, one could say without hesitation that, should this ever be done, the fertiliser would contain subterranean clover, and furthermore, if the Wairarapa were coated from end to end in this manner very little of the seed would fall on unsuitable ground, while, with the possible exception of kitchen gardens, it would nowhere do any harm.

This rather sweeping statement is in no sense an exaggeration, but is based on experience gained over the past three or four years from experiments laid down by the Department of Agriculture and by practical farmers. On hill country, on rolling clay and on light flats, subterranean clover has shown itself capable of bringing about an almost incredible transformation in the short space of two or three years, and in a fashion too spectacular and striking to permit of any doubts as to its practical and economic value.

Severe Trial

One of the first of the experimental plots laid down on the Wairarapa hills was a surface-sown trial on Mr. Jas. Andrew's property at Whareama, and although a slope conveniently close to the road was chosen, it was considered to be about as hard as anything on the property. The photograph, Fig. 2 (a) does not in actual fact give a very true idea of the poor, open, yellow and stunted pasture that was chosen as a side for the plots, but makes the sward appear rather better than it was. Despite this, however, the contrast with the plot (Fig. 2 (b)) which received two topdressings in the three years, after subterranean clover was sown, is sufficiently striking to require little comment.

The attainment of the dense sward of clover represents a highly important stage in the regeneration of this country. It must surely be unquestioned that such a sward will pay handsomely for topdressing even if it had reached the limit of its improvement. The vital point is, however, that this marks only the end of a chapter in the fertility rebuilding story—such a sward, topdressed, carried many stock, and animal manures are still our real source of fertility. When increased stock concentration makes it possible to cover the whole area with stock manure, as it has covered the spot in Fig. 2 (c), only then can we feel that the regeneration of this country is well and truly initiated. There is, of course, much of this East Coast hill country that is very difficult to topdress, and a number of property owners are endeavouring to establish subterranean clover without topdressing. Fig. 3 shows a fairly typical three-year stand which was not top-

Fig. 1 (b).—The soil-builder on light country. Perennial ryegrass and white clover following three to four years of dominant subterranean. Central Hawke's Bay Plains.

Fig. 1 (a).—Pasture improvement on light country. From sweet vernal and browntop to dominant subterranean clover, carrying six to seven ewes per acre and fattening all the lambs. Central Hawke's Bay plains.

Fig. 2 (a).—Typical original sward —danthonia, sweet vernal and browntop with suckling and striated clover —much bare ground and flat weed. Control plot from experiment on property of Jas. Andrew, Whareama.

Fig. 2 (b).—From a plot adjoining Fig. 1—a dense sward of subterranean clover after three years; twice topdressed with 3cwt. of super per acre. From this stage soil fertility is rapidly built up. Topdressing must pay on such a sward.

Fig. 2 (c).—From the same plot as 6 *(b)*, but from a spot which had received stock droppings and urine. Ryegrass is appearing among the vigorous subterranean clover. As carrying capacity increases the whole plot will improve to this stage and better.

dressed. Compared with Fig. 2 (a), it is a substantial improvement, but it is rather poor alongside Figs. 2 (b) and 2 (c).

As a general rule, "sub" without "super" is slow to develop a good sward, and is relatively unproductive and stunted. In fact, so great is the response of this plant to superphosphate topdressings and so vitally important is its contribution to the regeneration of these poor hill pastures, that the expense of special tracks and implements to take manures to the back country is in most cases fully warranted.

Another early experimenter with subterranean clover who is now a thoroughly converted enthusiast is Mr. Hugh Morrison, of Awatoitoi. While he has been fairly generous with his seeding and topdressing, Mr. Morrison has given his sub. some really tough tasks to perform. Fig. 5 (a) shows a hard, poverty-stricken slope that is typical of the country which has been tackled with spectacular success on Awatoitoi, and in two or three years slopes like these have been converted from poor wether country into useful fattening country.

Runner Development

A very important point in the successful establishment of sub. clover is illustrated in Fig. 5 (b), which is a photograph taken on Mr. Morrison's farm early last December showing the runner development of subterranean clover on hard country after a spell of about two months. The area enclosed in the photo is about one square yard, and it is obvious that this area will be densely populated with plants next autumn. It is because of this feature of subterranean clover that many of the arguments waged over seeding rates can be considered quite pointless. A single plant spelled in this way produced probably from 100 to 200 seeds, depending on the quality of the soil, length of spell, etc., so that all we need achieve in the original sowing is a rate that will give us a plant or two to each square yard.

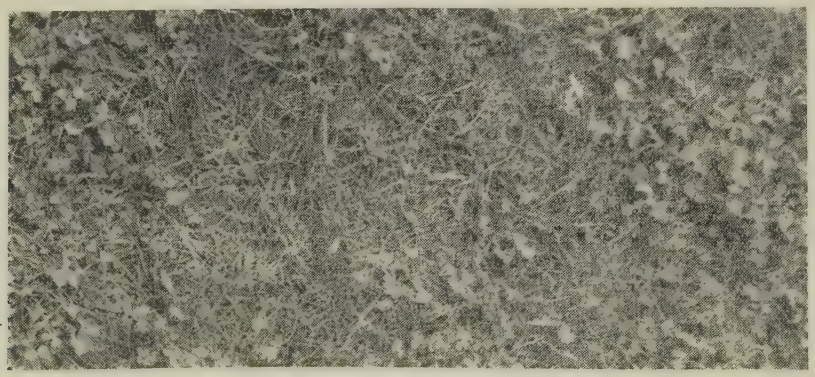

Fig. 3.—Three-year-old subterranean clover with no topdressing. The clover is useful, but the plants are small and the spread has been slow compared with plots receiving super.

Even allowing a substantial margin for seedling mortality, 3 lb. per acre is sufficient for this purpose, and when we consider that after a good spell in the spring the ground may be coated at the rate of 300 lb. to 600 lb. per acre, there is little point in debating whether another pound or two should have been sown in the first place. There is no question that the sound policy is to exploit fully the prolific seeding powers of the plant by adequate spelling in the first spring and to devote the money saved from the difference in the cost of 3 lb. and 6 lb. to an extra hundredweight of superphosphate.

In the opinion of the writer, this first spring spell is an extremely im-

portant point. The longer the spell the better, but usually it is sufficient to spell from early October, when feed is becoming more plentiful in any case, always provided that the area has not been over-punished during the winter.

On both the above properties surface-sown plots have included the Tallarook (late) as well as the popular Mt. Barker strain of subterranean clover. By way of general guidance one would say that Mt. Barker is definitely a more useful type than Tallarook if we consider each as a pure sowing, but there are grounds for believing that a mixture—say, 3 or 4 lb. of Mt. Barker to 1 lb. of Tallarook—would be a little better than the former alone, particularly in certain seasons. Towards the end of November, Tallarook is certainly pleasing, and may be expected under favourable conditions to extend the productive season of the sward. There is no apparent objection to this practice at any rate, and Mr. Morrison, for one, has adopted this as his standard procedure.

Fig. 4.—**A type of ploughable country in which subterranean clover is again the pioneer of fertility-building species—property of Mr. H. Martin, Otaraia.**

Other Clovers

In addition, one cannot overlook the value of other clovers, notably white clover of good certified type. Experiments are still under observation which will provide further information on this point, but already one feels justified in recommending the inclusion, on the better country at least, of ½ lb. to 1 lb. of a good white clover with the surface-sown subterranean. Last spring, again on Mr. Morrison's property, white clover which was surface-sown in this manner was very successful, and although it was definitely a good season for white clover, it should be no less prominent as fertility is raised following the increased stock concentration that must be a consequence of the strong subterranean clover establishment.

While many other examples of the use of subterranean on hill country could be quoted, these two have been selected partly for the reason that experimental plots have been established on both for some time, and partly because these properties are reasonably typical of the very large areas of the second quality country which composes the Wairarapa East Coast hills. The results obtained are convincing proof that subterranean clover, established simply by surface-sowing on deteriorated swards, can supply the means of substantially and economically reversing the process of degeneration which has occurred, and undoubtedly still is occuring, in this class of country.

Important as its work may be on steeper country, subterranean clover has a value equally as great on ploughable areas of various soil types. Fig. 8 is a view of a "giant" disced area on the property of Mr. H. Martin, Otaraia, and although immediate results are even more spectacular where

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a good grass mixture can be sown on a prepared seed-bed, the same principles apply as for surface-sown areas, and the essential first stage in the improvement process is the establishment of a strong sward of subterranean clover (for a more full discussion of Mr. Martin's methods see this "Journal" for March, 1940).

Soil Groups

For present purposes we may regard the Wairarapa soils outside the hill country as falling into four main groups.

(a) Shingle flats—in this class there is a big range depending on the varying portion and size of the stones.

(b) Light silty flats—usually with some small stones or stony patches and often overlying shingle.

(c) Rolling clay country lying at the foot of the East Coast hills and between the Martinborough and main valleys.

(d) Heavy silt and clay loams with good moisture-retaining properties.

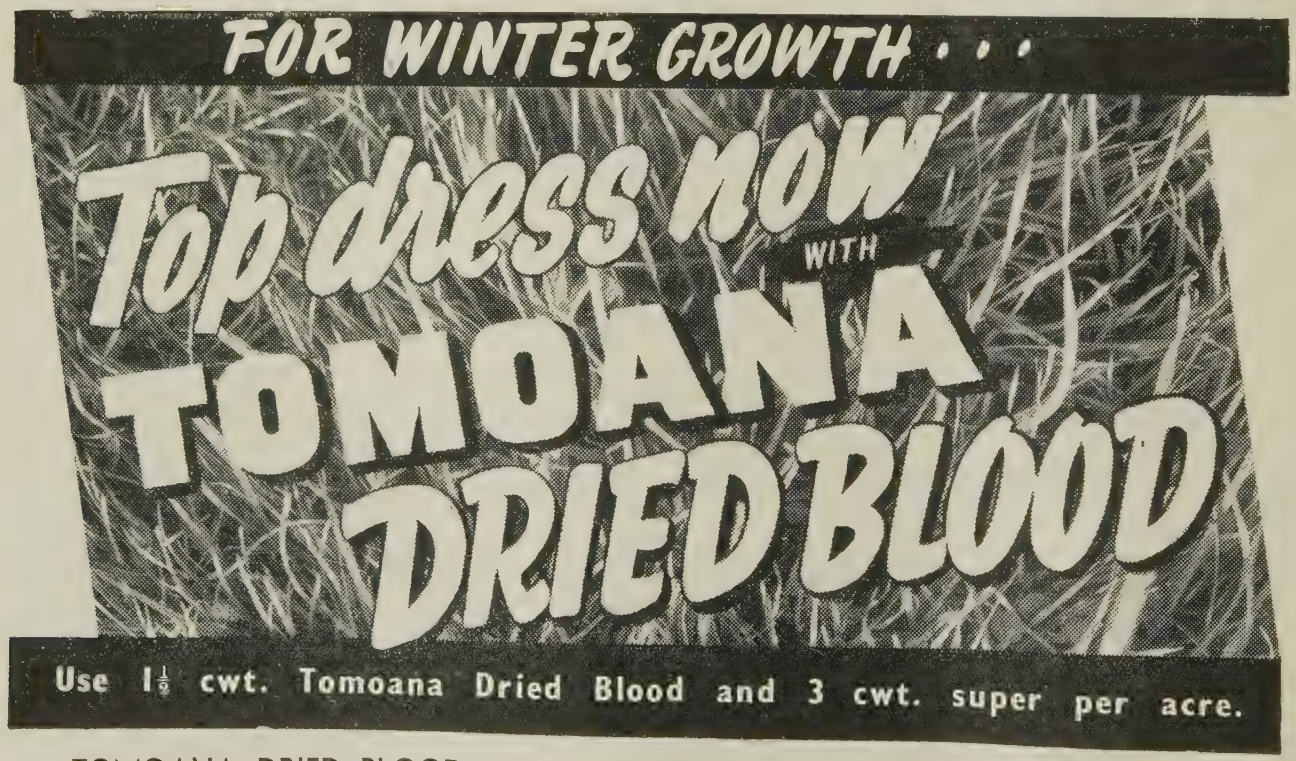
On the first three classes the value of subterranean clover cannot be disputed, while even on the best soils there may be a place for it under certain conditions. In fact, soil type is of significance in deciding whether this plant will be useful only in respect of its ability to retain moisture in the dry weather. There is no type of country in the Wairarapa where subterranean clover can do any harm, but there are localities where it is a waste of time to sow it, and these are those areas where, by virtue of soil type or climate or both, sufficient summer moisture is available to grow a first-class white clover well.

Medium soils close to the Tararua Ranges which are subject to showers that do not extend out on to the plains, or heavier soils further out which remain green and moist throughout the summer, will, with adequate management, grow good type perennial white clover sufficiently well for it to dominate and suppress the annual subterranean. For instance, with the exception of shingly river beds, there is no point in sowing subterranean in the Kaipororo-Nireaha-Hamua area or on the better Dalefield-Matarawa soils. On the other hand, it is very often quite impossible to prophesy with accuracy whether subterranean will or will not do well because of the dominating influence of the kind of season experienced, but it may be accepted as axiomatic that the species which dominates is the most suitable species. Consequently there is no alternative but to sow both subterranean and mother seed white clover and simply to allow the two to adjust their relative positions according to season, etc.

Sometimes we get a transition from dominant subterranean to dominant white as the pasture ages—no doubt largely due to the increased soil fertility which the former builds up. Frequently, we see this transition during the course of a season, early spring subterranean dominance changing to late spring and summer dominance by white clover.

Example of Change-over

One of the most striking cases of this change-over was noted last spring on the experimental plots on Mr. C. J. Nix's property at Tauherenikau (Fig. 6 (a). These plots towards the end of October showed a very nice mixture of species, with subterranean definitely the dominating clover. About



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five weeks later the photo Fig. 6 (b) was taken, and although this may not reproduce well, the mass of white clover flower heads should be easily seen. It was, in fact, difficult at this stage to find any subterranean clover at all unless by looking underneath the white.

The plots on Mr. Nix's place were sown in the autumn of 1939 partly to test out subterranean clover strains and partly to gain more information concerning the subterranean-white clover relationship. The plots on the left of Fig. 6 (b) received a good mixture of certified ryegrass, cocksfoot, certified mother white clover and subterranean; those on the right received certified ryegrass and subterranean clover only. These plots and a similar series laid down at the same time on Mr. W. G. Martin's property near Martinborough have definitely established the case for the inclusion of white clover with subterranean clover on both the shingle plains and the rolling clay country.

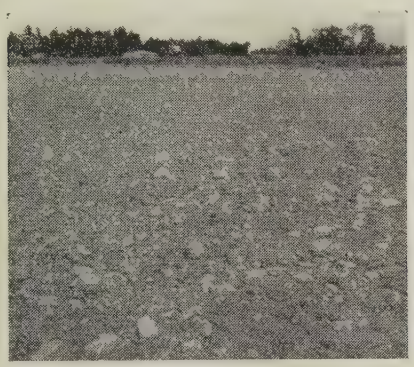

Fig. 6 (a).—Location of plots on property of C. J. Nix, Featherston. Photo taken just before sowing. Note the stony nature of the soil.

Fig. 6 (b).—A view of the plots on Mr. Nix's property. The value of the inclusion of mother seed white clover, even on this boulder country, has been very striking this spring.

Of the strains of subterranean clover that have been tested in the field, little more can be said in addition to the remarks already made concerning Tallarook and Mt. Barker, and the general recommendation that a mixture of the two, with emphasis definitely on Mt. Barker, is likely to give best results. The Dwalganup strain has grown, but has been absolutely useless, while the Burnerang type, which was so very promising in early plot trials, has completely failed on all five field trials in the Wairarapa.

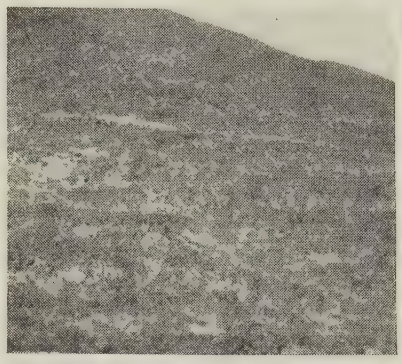

Fig. 5 (a).—The type of hard country which Mr. Hugh Morrison is regenerating with "sub and super."

Fig. 5 (b).—The importance of the first spring spell cannot be overemphasised. By allowing the sub. clover to develop runners like these Mr. Morrison obtains a good, dense sward in the second year. (The area enclosed in this photo would be roughly a square yard.)

Cutting Hay Crops

Complaints are not infrequently heard concerning difficulties experienced in cutting hay crops consisting of dominant subterranean clover, and while the general condition and sharpness of the mower has quite a lot to do with it, there is no doubt that a "sub" hay crop can be a sore trial of patience and temper. Obviously a thin native sward (see Fig. 7) would be easier cutting than a dominant tangle of subterranean, but it is clear that in this illustration—only 18 months after sowing—the ryegrass and cocksfoot are strengthening to a point that will soon make the whole manageable.

It must be accepted that a sub. clover smother is, on much of the poor country, an almost inevitable but none the less desirable phase to be passed through. The much better germinating conditions usually obtained on culti-

Fig. 7.—Sub. clover on Wairarapa shingle flats. On the left is a turf typical of this country in its raw state. The sward consists of danthonia and sweet vernal, with the usual striated and suckling clovers. On the right—and then only a few yards away—a highly productive sward of ryegrass, cocksfoot and white clover is being built up on the foundation of strong sub. clover.

vated country may give this in the first year from a sowing of even 3 lb. to 5lb., and it will certainly be the consequence of the first spring spell, but once a strong stand is established every endeavour should be made to convert all the bulk of green stuff into animal manure. If this is done for a year or two—and, of course, provided a good ryegrass, cocksfoot and white clover mixture has been sown—these latter species will increase in strength to a point when mowing is more reasonably practicable.

Summary

(1) There is a place for subterranean clover on the hills, the rolling country and the flats throughout the Wairarapa. On hill country at least, the experimental plots discussed have been sown on poorer than average soils, but the results have exceeded all expectations.

(2) So responsive is subterranean clover to superphosphate that the two should not be considered apart. Don't "super" **or** "sub" the poor country, but "super-sub" it.

(3) Exploit to the full the prolific seeding of subterranean clover by giving it a spring spell as soon as possible. This ensures the essential first stage of pasture regeneration, which is an almost complete "sub" smother.

(4) When the smother is complete, use it to topdress the grasses by putting it through the stock.

(5) Of the strains tested, Dwalganup and Burnerang are of no use. Mt. Barker is the best, but may be mixed with Tallarook to obtain a longer growth period in the suitable season.

(6) Almost wholly throughout the Wairarapa subterranean and white clover should be sown together, with emphasis on the former under hard conditions and an increased proportion of the latter under better conditions.

Short Courses For Farmers

THE following short courses for farmers have been arranged to be held at the Animal Research Station, Ruakura:—

June 2nd to 6th.—First class: For those who have not previously attended a short course at Ruakura.

June 9th to 13th.—Dairy Farming Course: For those who have previously attended the first course at Ruakura, and whose interests lay in dairy farming.

June 16th to 20th.—Sheep Farming Course: As for the dairy farming course, but whose interests lay in sheep farming.

June 23rd to 27th.—Farm Management Course: Advanced course principally designed for those who are about to take up farming on their own account, and for others with extensive farming experience.

June 30th to July 4th.—A practical course for Maori farmers.

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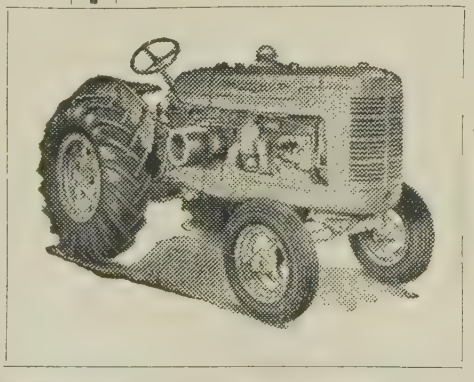

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On the farm, maximum use should be made of animal droppings. In many other parts of the world this is standard practice, and in New Zealand a considerable quantity of valuable fertilising material is washed away and lost for ever. The details of how best this material may be conserved and used on dairy farms appeared in an article by A. G. Elliott, Crop Experimentalist, on page 113 of the "Journal" for August 1939.

The possibility of the exploitation of animal waste on sheep farms is not so great as on dairy farms, but much can be done to see that all droppings are thoroughly distributed. On most sheep farms cattle are run in conjunction with the sheep, and it is important in these circumstances to use the harrow so that their droppings also are effectively distributed.

Fallowing the Land

A means of conserving fertility, frequently overlooked, particularly in average North Island farm practice, is the fallow. A fallow serves two very useful purposes in that firstly, it gives the opportunity for eradicating weeds of various kinds, and secondly, allows natural regenerative processes to go on in the soil. The effective consolidation achieved through fallowing is also important, particularly where the area is to be sown to permanent pasture.

Where land is cropped heavily and regularly a standard feature of many rotations is the inclusion of a legume, such as peas and lucerne. Much less spectacular, but certainly just as important, is the inclusion of ample quantities of legumes (clovers) in the grass seed mixture. This will serve the two-fold purpose of placing in the sward an effective converter of phosphates into animal food, and also a plant which is capable of accumulating nitrogen through the bacteria present in the clover roots.

Importance of Sward

Few farmers realise sufficiently the wastage of fertiliser that occurs when it is topdressed on a sward of species incapable of giving a satisfactory response. Apart from the need of the soil for nutrients which is, of course, the fundamental factor, it is essential to realise that the plant is the medium which converts the fertiliser into the form in which it can be utilised by farm stock.

The species in the sward which show the greatest and most obvious response to phosphatic manures are the clovers. In fact it is considered by some workers that the stimulation of grasses is an indirect effect, and that they benefit from the association with vigorous clover plants rather than from the direct effect of the fertiliser.

This arises because of two main factors, namely:

(a) The ability of the bacteria on clover roots to "fix" atmospheric nitrogen so that it is available not only to the clover plant but also to the associated grass species, and

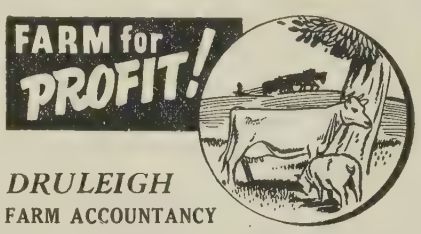
(b) The improved ground cover of a grass-clover sward over a grass only sward.

The clover plants in the sward are of value not only as stock food, but also in the effect of their association with other pasture species.

Using the Topdressing

The other aspect of this question is the greater use which the higher producing species can make of topdressing. The best certified strains of perennial ryegrass and white clover will give a greater increase in production from topdressing than will inferior plants, such as Yorkshire fog and annual clovers. In fact, some swards may not be worth topdressing because of the species which make up the pasture, and dominant browntop, particularly if sod-bound, is an example of this class.

However, one must not confuse this factor with the use of fertilisers, particularly phosphatic fertilisers, as a means of improving inferior swards by establishing conditions under which the better species may thrive. But in the present circumstances, where adequate supplies of fertiliser may not be available, farmers should realise that the greatest response will be given by the best swards, and under some conditions it may be advisable to restrict the use of manures to the best of fields. In any case, it will be obvious that a practical means of improving the efficiency of phosphatic fertilisers is the sowing, establishment and maintenance of the superior pasture species.



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SAVE YOUR OWN TOMATO SEED

By
D. K. PRITCHARD,
Instructor in Vegetable Culture,
Wellington.

Fig. 1 (left).—The cut tomato before squeezing out the seed.

Fig. 2 (below).—Squeezing out the seed into a receptacle.

GROWERS should exercise every care that tomato seed is taken only from strong, vigorous, and healthy plants of high productivity, and that the tomatoes selected should possess the necessary characteristics of the type which it is desired to produce and which will be most suitable for the locality where production is being carried on.

A prominent U.S.A. authority, after discussing the relative merits of home-grown and purchased seed, states: "Selection intelligently and carefully carried out will give, in from three to five years, strains of seed greatly superior and better adapted to one's own conditions than any which it is possible to purchase."

Literature available on the subject is definitely in favour of home-grown seed selection as a means of improving the strain of the variety grown and also of increasing the yields of fruit. There is considerable evidence that yields can be materially increased by selection, and that home-grown seed from disease-free plants of high productivity and early maturity produces heavier crops than much of the purchased seed, particularly that of unknown origin. Seed taken from the product of low yielding plants will almost invariably produce weak plants of poor germination, while seed taken from the most productive and most uniform plants will produce the heaviest crops with a high percentage of uniformity. High productivity and early

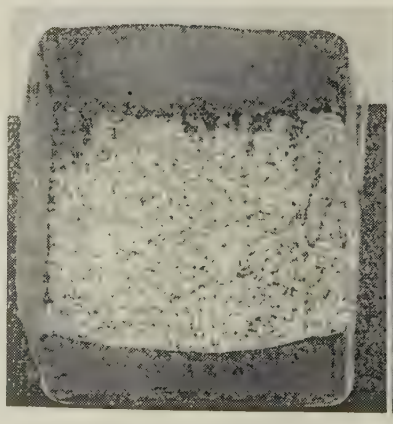

Fig. 3.—The seed separated from the pulp.

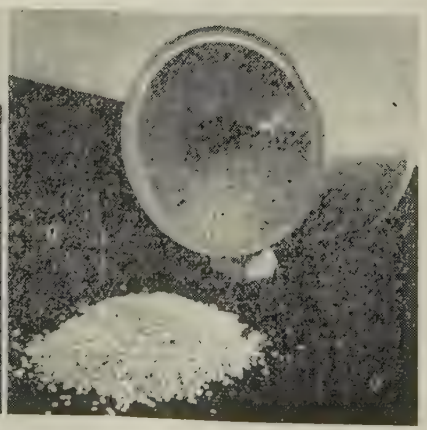

Fig. 4.—The finished product—the dried seed.

[*A. L. Bryant, photos.*

maturity can be obtained only from selected vigorous, healthy and disease-free plants.

Plant Selection

To achieve these results, special attention should be paid to plant selection, and, in addition, good cultural practices must be adopted. Unfortunately, the fact that high prices may be paid for seed is not always a guarantee of high quality.

It has been established that certain plant diseases can be and are transmitted through the seed, and tomatoes are particularly susceptible to hereditary disease. Concerning "bacterial canker" the Queensland Agricultural and Pastoral Handbook states: "This disease is a recent 'introduction' to Queensland, but possesses the potentialities of becoming one of the most serious tomato diseases of the State."

Because of the conditions obtaining in Europe, particularly in Britain, the production of tomato seed in New Zealand is one of considerable economic importance. Under present conditions no reliance can be placed on obtaining seed from overseas, nor is the importation of tomato seed warranted. Disappointment often follows the use of imported tomato seed because of the influence of soil and climatic conditions on the subsequent crop. Provided the necessary care is taken in plant selection, seeds of high quality can be produced within the Dominion.

In selecting tomatoes for seed, while many growers contend that they should be taken only from the bottom truss of fruit, exhaustive experiments carried out in seed production do not justify this contention. If, when secured, the tomatoes from which it is intended to extract the seed are not fully ripe, they should be kept in a reasonably warm place until well ripened. It may be noted, however, that vine-ripened fruit is considered best for seed production.

Method of Extraction

The tomato should be held in the left hand, and, with a sharp knife, cut through the centre at right angles to the stem, separating the fruit in two. Holding one half in either hand, cut surface turned downwards, subject each to gentle pressure until the entire pulpy content is squeezed out into a scrupulously clean receptacle placed under the hands of the operator. By this method—through the rejection of the main bulk of the tomato—all the seeds are obtained, and, in the final washing, a great amount of labour will be saved.

After this operation is completed, the pulpy mass in the receptacle should be held at a temperature of not less than 65 degrees to 70 degrees Fah. for five or six days while fermentation takes place. Some growers stir the pulp occasionally with a clean piece of wood, but this is not necessary. Other growers allow the mass to settle, which results in a thick coating forming on top.

Washing the Seed

In washing the seed, plenty of fresh, clean water is absolutely essential. Assuming that the pulp has been kept in a clean petrol or kerosene tin and that this is half-full, the contents should be well stirred and the tin almost filled with water. A good plan at this stage is to use both hands for the purpose of gently crushing any lumps which may be among the pulp, as it will be noticed that quite a lot of seeds will be adhering to them. Having given the seed a little time to settle, and while the pulp is still floating among the water, start the process of separation by gently pouring out the contents from one "corner" of the tin until the seed is seen to appear. This operation should be repeated—using plenty of water—until the seed is separated from the pulp, when it is finally poured into a fine strainer and allowed to drain. After draining it may be spread out thinly and dried quickly.

Before storing for future use the seed must be perfectly dry. Damp seed will result in premature germination. As the "life" of tomato seed is from five to six years, a considerable quantity can be produced from one crop. There are from 5,000 to 6,000 seeds in one ounce, and the germination of one-year-old seed ranges from 70 per cent. to 85 per cent.

This method of tomato seed extraction is equally applicable to the small grower, provided the suggestions made are adopted and the directions given are followed.

To Farmers' Wives and Daughters

Have you read our new Women's Section — "The Good Neighbour," by Mary — at the back of the "Journal"?

Here are some of the items in this month's issue: "Brightness for Wet Days," Beauty Hints, Household Hints, Tasty Recipes, and Competitions.

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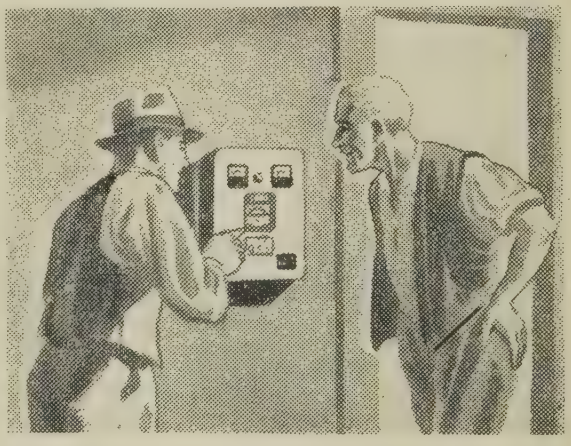

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Production of Cocksfoot Seed In Mid-Canterbury

Although Akaroa is the largest cocksfoot seed producing area in the Dominion, the Ashburton County gives profitable yields. In this article an outline is given of the growing of cocksfoot in that district.

By

G. K. McPHERSON,

Instructor in Agriculture,

Ashburton.

AKAROA is the largest cocksfoot seed-producing area in the Dominion. Next in order of importance is the Ashburton County, where in 1937 some 3,500 acres were harvested for seed. Since then many new areas for seed production have been sown. Odd stands occur in the Methven, Mayfield, Winchmore and Wakanui districts, but fully 90 per cent. of the seed-producing area lies between the Ashburton and Hinds Rivers and east of the railway line.

Some indication of the yields of machine dressed and field dressed seed per acre can be gained from a perusal of the following table of the approximate average figures derived from areas under certification:—

Season.	Lb. Seed per acre.	Lb. per acre M.D.	M.D. Loss.
1933/34 ..	64	36	44%
1937/38 ..	220	139	36%
1938/39 ..	300	230	23%

These figures indicate that the yields may show a wide variation from season to season. Climatic conditions are perhaps the main factor influencing the yield in any one year. For example, the very low yields in the 1933-34 season were due to late frosts occurring when the cocksfoot was approaching the flowering stage. Lack of sufficient rain at critical periods also had an adverse effect on yields. In a normal season, however, a yield approaching 250 lb. of field dressed seed per acre could be expected, which, at 6d. per lb., gives a gross return of £6 to £7 per acre. The total value of the industry to the county, therefore, would approximate £20,000 annually. The table illustrates that seasonable conditions may also influence the quality of the seed considerably. High per acre yields are usually associated with good quality seed.

Soil Types

Cocksfoot for seed production may be grown on a variety of soil types, but the most satisfactory yields in the Ashburton County are obtained from river silts, free working loams and soils of a peaty nature containing an admixture of clay. Stiff clayey soils which are inclined to crack during dry weather or soils with an ironstone pan do not suit cocksfoot.

The cocksfoot industry in this county is centred mainly in the Eiffelton-Flemington district, where much of the soil is ideally suited to this plant. Cocksfoot, however, can be grown successfully in other parts of the county. Any soil of an open texture and which is reasonably fertile should produce economic yields of seed. Cocksfoot is grown for seed on some of the lighter plains land, but seasonal conditions there cause a greater fluctuation in yield than on the better cocksfoot country.

Establishment

Usually, little difficulty is experienced in obtaining a successful stand on land naturally suited to cocksfoot. Instances occur where 3 lb. to 4 lb. of cocksfoot in an ordinary grass mixture have, with proper management, eventually resulted in cocksfoot-dominant swards producing very profitable seed yields. Where the soil conditions are not so favourable, however, more care has to be exercised if a first-class stand is to be obtained.

In the Eiffelton district many different methods have been adopted in the establishment of cocksfoot areas, and it is difficult to say which has proved most successful. In most cases the cocksfoot has been broadcast with a crop such as wheat, oats, barley, or linseed, sowings taking place in late April or May or September-October. Some farmers have made a practice of including a few pounds of red clover with the cocksfoot, and many successful stands of cocksfoot have been obtained in this way. More recently, however, there has been a tendency, with new areas, to drill the seed pure, but whether to sow in this manner or with a cover crop depends largely on circumstances.

If weed growth of an annual nature is inclined to be prevalent on the area, sowing with a crop would appear the best method, as the crop as-

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sists in checking the weed growth while the young cocksfoot is establishing. Various forms of twitch, such as *agropyron repens, poa pratensis,* creeping fog and also docks and yorkshire fog, are some of the worst enemies of cocksfoot, and if a successful stand is to be obtained these plants must be eradicated before sowings take place. The low yields occurring in many stands can be largely attributed to the smothering action of twitches and yorkshire fog.

Quantity to Sow

There is much diversity of opinion regarding the correct amount of seed to sow for a successful stand. On clean land 7 lb. to 8 lb. of seed per acre would appear sufficient, but where the young cocksfoot has to compete with weed growth, a heavier seeding of at least 12 lb. per acre seems desirable. Undoubtedly, the lighter seeding gives the more robust plants, but at the same time it also gives weed growth a better opportunity of becoming established in the initial stages. Perennial ryegrass is very difficult to dress out of cocksfoot seed, and only lines relatively free from ryegrass should be sown.

Practically all the seed cocksfoot grown in the Ashburton County is of the Akaroa type, but seed of an improved strain—C.23—is now available, and should be sown on all new areas. If cocksfoot is being drilled the seed may be sown through the grain feed or mixed with the manure. Reverted phosphate at the rate of 1 cwt. to 2 cwt. per acre should be used. December or January are suitable months for sowing cocksfoot in the absence of a cover crop.

Harvesting

The usual method of harvesting is to cut the crop with the binder and leave it in the stook for approximately a fortnight before threshing. Stacking is unusual. Windrowing the crop, followed by the header with pick-up attachment, has been attempted in a few cases in recent years.

Management of Seed Areas

After establishment, cocksfoot seed areas require very little treatment or management. Some farmers graze their stands periodically with cattle, and provided this is carried out in the early autumn and grazing is not too severe, no harm appears to result. However, the practice of grazing annually or grazing too severely, particularly with sheep, is not recommended. Over-grazing undoubtedly weakens the sward, thereby permitting the ingress of foreign growth.

The advisability of removing much of the dead leafage which accumulates after a stand has been down for a number of years is a problem which has exercised the minds of many cocksfoot seed producers. While this mat of dead material undoubtedly assists to smother any foreign growth, it is quite possible that an excess has a detrimental effect on the growth of the cocksfoot. Trampling with stock is the only method which has been used so far to prevent the accmulation of this material. Whether mowing of the stubble, with removal of dead growth, harrowing, or burning where practicable offer means of control are aspects of the question which require investigation.

The economics of systematic top-dressing of established stands of cocksfoot also presents another avenue for research. As a general rule, the seed yields fall away as the stand ages, and it is possible that applications of suitable fertilisers may arrest this decline or even increase the yield.

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Veterinary Notes for the Farmer

Discussions on First-Aid Measures

Contributed by the Livestock Division

Prevent the Spread Of Abortion Disease

THE dairy farmer is frequently confronted with one or more cows aborting during April or May, and it is frequently a problem to know what to do with such animals. In all probability the animals are affected with the disease of contagious abortion, and consequently are a direct danger in spreading infection in the paddocks where other cows are grazing. The spread of infection is so easy by this direct means that some steps should be taken to isolate the animal until all dicharge has ceased. The aborted calf and all discharges are liable to be teeming with the infective organism of the disease, and should be collected and burned or deeply buried.

If a hospital paddock or isolation paddock is available the affected animal should be confined in it until treatment has been carried out and all discharge has ceased.

Removal of Membranes

In many cases the affected animal retains the membranes for several days, and steps should be taken to douche out the animal regularly with a weak antiseptic solution to assist in the removal of the membranes and discharges. If the membranes are removed by hand, burning or burial is again necessary to prevent the spread of infection through the contamination of food or water. A conscientious effort should be made to remove all the membranes and discharges to ensure that the womb will remain in a healthy condition for future breeding.

One of the most common sequels to abortion is a chronic infection remaining in the womb, setting up an accumulation of pus, and resulting in the cow failing to get in calf the following season. Care should be taken to use only clean rubber tubing and a clean funnel with some reliable antiseptic made up with boiled water, cooled to blood heat. There are many antiseptics on the market. A salt solution prepared by dissolving one ounce of table salt in a gallon of boiled water will prove very satisfactory, or a weak solution of permanganate of potash may be used.

The cow should be douched out with the selected solution once daily until the membranes come away, and thereafter every second day or twice a week while any discharge lasts. It is advisable to wash down the hind quarters and tail thoroughly to remove all adherent discharges when finally cleaning up the animal. At this stage the animal may be returned to the herd.

Merits of the Case

In all probability, the cow will be milked through the winter if the position warrants it. On the other hand, culling may be decided upon, in which case the animal may be sent to the works for slaughter. Each case requires to be dealt with on its merits in deciding the line of action to be taken. In any case, if the animal is retained, it is not advisable to attempt breeding until at least two months after all discharge has ceased. If the

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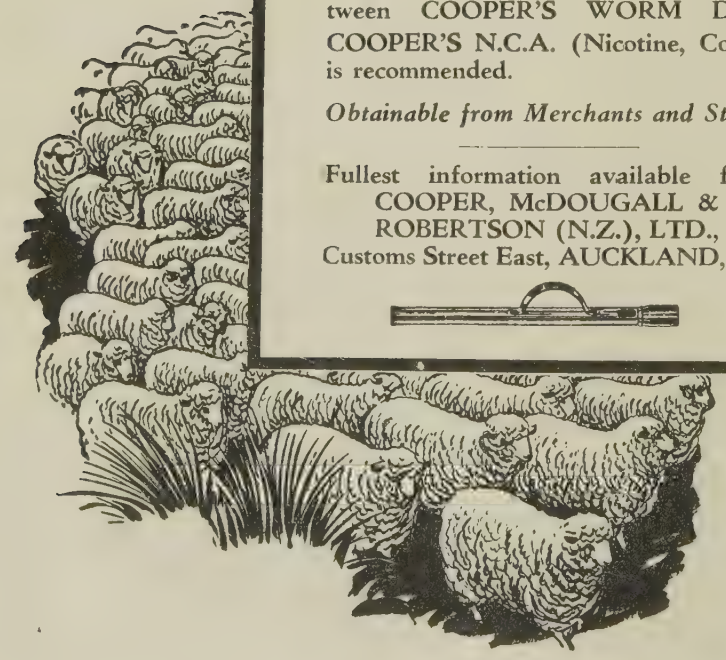

Dosing is often as important as dipping!

abortion takes place early in the case of a young heifer there may not be sufficient milk to justify milking the animal through the winter. If such an animal is retained, she may be turned out with the dry stock after all discharge has ceased. It is, however, advisable to keep the bull under control in such instances, as these animals frequently appear in heat soon after abortion.

As a matter of policy it is advisable to retain the aborting animal, and to treat it as suggested rather than to cull and buy in fresh stock for replacement purposes. The animal which has aborted has developed a degree of immunity against the disease, whereas the bought-in animal may have no immunity, and hence the disease may be carried on from year to year by adopting the cull-and-buy policy.

It is recognised that self-contained and self-maintained herds have less trouble from abortion disease than herds where replacements are made by the purchase of animals whose disease history is not known. The most difficult position to advise upon is the instance where a storm of the disease has flared up, affecting a large number of animals in a herd. Such outbreaks should be fully discussed with the veterinarian in your district, as so many features have to be taken into consideration that it is impossible to define a course to follow.

Feeding Oats to Lambs and Sheep In the South Island

AS there is a probability of a shortage of green feed during the coming winter, sheep-owners should consider the advisability of supplementing the feed with a ration of oats or oats and chaff. Mr. H. E. Jessop, of "Alaska," Methven, has forwarded the following suggestions through the Inspector of Stock, at Ashburton.

At first there may be some difficulty in getting the sheep or lambs to take the oats, but this can easily be overcome by keeping them in a small paddock containing several feeders holding the oats, which have been sprinkled with molasses, and in a day or so the oats will be readily eaten.

A good number of feed troughs should be provided. Use one 12ft long trough for each 20 or 25 lambs, as the lambs settle down to feed better when they have plenty of room.

The oats must be sound and clean; seconds may be used provided they come into this classification. To begin with, one bag of oats, approximately 140lb, is sufficient for about 500 lambs per day, this quantity being gradually increased until about 1lb is fed per lamb each day. Lambs or sheep on rape or turnips are greatly benefited by a supplementary ration of oats, but when on rape it is advisable to take them off during the night in order to prevent an attack of bloat.

Mr. Jessop is a very strong advocate of oat feeding to all classes of sheep on any kind of green feed—turnips or rape—and considers that after a farmer has tried this supplementary oat feeding he will always continue the system.

Experiences Of Farmers

In addition to the above, the following extracts have been taken from experiments made by other farmers.

A South Canterbury farmer found that he could fatten cull ewes on grass by giving them a supplementary ration of crushed oats, 1lb per head per day. He mentions that he noticed a stray lamb in poor condition which was seen to come regularly to the feeders for its ration of oats, and when drafted six weeks later it went away a first-quality lamb weighing out at 33lb.

In bad weather it is advisable to add chaff to the oats, using equal quantities of each. The chaff should be added by putting it on the bottom of the

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trough and the oats on top, without mixing. During the feeding of oats to the sheep the weather was anything but good for fattening, so that it would appear that under favourable conditions a great deal less grain would be required.

Another South Canterbury farmer is feeding oats to his sheep, but not so heavily. He uses a mixture of oats and oaten sheaf chaff, one of oats to two of chaff. He began feeding the dry feed in December while the lambs were running with the ewes, and reports that he had no trouble getting his lambs away fat. On each of the above farms the death rate was noticed to be quite small, and this was during the time when parasitic trouble was very prevalent.

Safeguard Against Parasites

Giving supplementary feed to lambs when they are with the ewes is a strong safeguard against the start of parasitic invasion, which is the principal cause of later troubles at the hogget age, and also prevents any possible check at weaning time.

Sheep should be taught to eat supplementary feed at an early age in order to prevent their receiving a bad setback when feed has to be put before them during very inclement weather and their natural feed is unobtainable.

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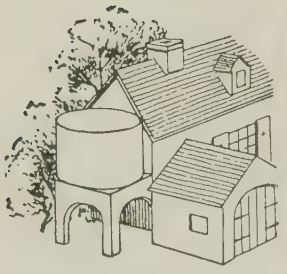

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Answers to Correspondents

Cow's Dislocated Hip

M.J.L. (PAEROA):—

I would be very pleased if you would answer the following question per medium of the "Journal of Agriculture."

We have a good producing cow which put her left hip out of joint about three months ago as the result of a fight. I understand there is a way of getting the hip back into its socket, and would be pleased if you could advise us how to go about it.

LIVESTOCK DIVISION:—

In all cases of dislocation, the earlier the bones are replaced in their correct position the more likely is the chance of success. The possibility of a fracture accompanying a dislocation has always to be considered; this, if present, would render permanent replacement hopeless or useless.

In the case of the hip joint there is a tendency, after five or six months for the head of the thigh bone to form a new socket for itself which will serve the cow well, although lameness will always be present, and the keeping of the animal on flat paddocks will be necessary.

Replacing a dislocation requires the administration of a general anaesthetic and considerable skill and knowledge in the manipulation of the affected parts. Reduction of a dislocation after three months' time, even if possible, is not likely to give satisfactory results.

Stock Eating Pine Needles.

"ENTHUSIASTIC SUBSCRIBER" (TUAKAU):—

I am rather worried about our stock, which whenever they get a chance show a great liking for pine needles. Also, I have noticed them licking cream cans, etc. I was wondering if some sort of a lick is needed. Awaiting a reply through your "Journal."

LIVESTOCK DIVISION:—

It is unfortunate that you do not give more details as to the class of stock to which you refer in your inquiry. If the animals referred to are young animals, one would suspect them to be affected with worms. In such a case it is a common practice

in districts where pines are available to cut down branches for consumption by the young stock, as it is held that the consumption of pine needles has a beneficial effect on young stock consuming them.

Although this practice has been used, it is at best a very poor attempt at the treatment of worms in young animals. It should not be depended upon, and some recognised worm medicine should be given to the affected animals. At the same time, any system of treatment for worms must be based upon sound feeding and management.

If, on the other hand, adult animals are affected, the question of worms can be eliminated. One would suggest the provision of a salt lick containing one part of sterilised bone flour in three parts of salt.

Sores on Cows' Teats.

"NORTH AUCKLAND FARMER":—

Recently some of my cows have had an unusual type of sore on their teats, and I find that all the remedies I have tried so far have done no good. The sores start through a ring formed of small lumps, similar to ringworm, and spread towards the centre, forming a putrid-smelling sore. At this stage the sores get no worse and no better, except in cases a little bigger.

If you could please inform us as to the cause of this disease and how to prevent or cure it I would be very grateful.

LIVESTOCK DIVISION:—

The sores described by you on the teats of some of your cows are apparently a type of pox blister, which probably become infected with other dirt organisms; hence the resultant sore which does not heal readily. The sores are easily spread from infected cows to the healthy cows by means of the hands, washing cloths and milking machines. It is necessary, therefore, to endeavour to isolate the affected animals and milk them last, carefully, by hand.

In order to assist healing of the sores when they reach the chronic stage, it is necessary to bathe the affected teat thoroughly in a weak antiseptic solution of Condys or boracic in water. This bathing will loosen and remove the dead or necrotic centre which prevents the sore from healing. If much grease is present on the teats, either through the use of vaseline or curative ointments, this requires to be removed by using some solvent, such as benzine. Immerse the teat in a cup containing peroxide of hydrogen, when the scab will gradually soften and may be removed in its entirety. This is essential before healing can take place.

A suitable dressing to be applied to the clean, raw, bleeding surface free from crust or scab is a saturated solution of salicylic acid in glycerine. This gives good results, and can be obtained from any chemist. Half an ounce will do a lot of dressings if applied with a small camel hair brush.

As the treatment is rather tedious, it is most important to try and prevent any spread of the disease to clean members of the herd, as already indicated.

Advisory Service on Veterinary Matters.

Farmers are invited to submit inquiries connected with the health of their stock, and the replies will be published under this heading.

Trouble With Horse's Foot.

"DIGGER" (Gisborne):—

I have a horse (colt) which is now turning three years old, and on his right front foot he is showing the signs of a splint coming up badly. He has been running on the hills with another colt of the same age, and as far as I know he has not been galloped. Could you please tell me how I could get rid of the splint without blistering it and leaving a mark. Could you tell me through your "Journal" what is the cause, and a cure to remove the splint?

LIVESTOCK DIVISION:—

The appearance of a splint in a young three-year-old colt does not call for any special treatment. It is very doubtful, however, whether you are referring to a splint, as you give the location as the front foot, whereas splints arise on the cannon bone between the knee and fetlock joints. You are probably referring to the development of a ringbone which may be seen on or near the joints immediately above the hoof. Ringbone must be considered much more seriously, as it is classified as a hereditary unsoundness, and, moreover, it is very difficult to keep a horse sound when affected with this disease on or in the vicinity of a joint.

Once a bony enlargement such as a ringbone has been formed it is impossible to reduce it or remove it without either blistering or firing. If you are dealing with a splint on the cannon bone the regular and repeated application of strong tincture of iodine will assist in the reduction and absorption of the splint without leaving a scar. Apply the iodine daily until the skin becomes tender and scaly. Then rest for a few days and again repeat the same line of treatment. A fuller description of the exact location of the swelling would have been of considerable assistance in knowing the exact nature of the enlargement.

A CORRECTION.

In a recent advertisement of Premier Products Ltd., N.Z., Manufacturers and Distributors of Kartet Sheep Drench, the word Tetrachloride was omitted. This should have read as: KARTET (Carbon Tetrachloride).

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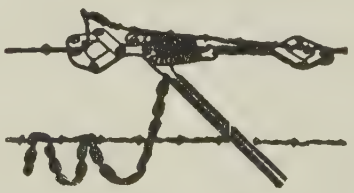

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Farm Practice and Management

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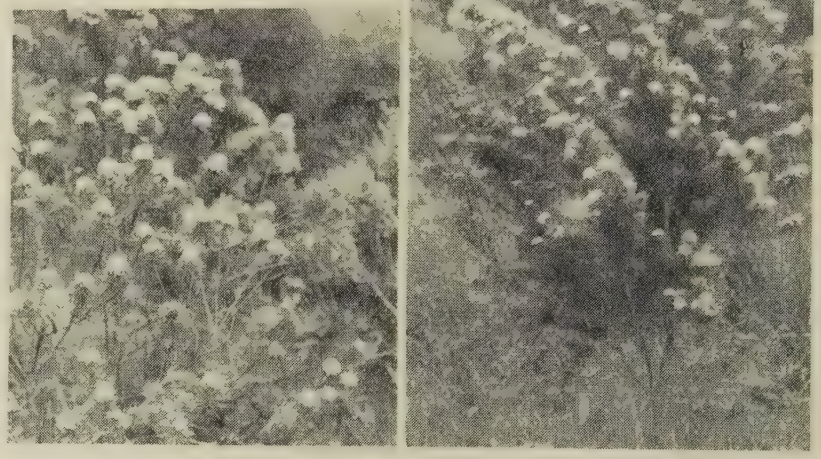
Psoralea Pinnata Is An Aggressive Weed

A RECENT examination of hill country adjacent to Coromandel township revealed the fact that an aggressive plant, *Psoralea pinnata,* threatens to take possession of fairly extensive areas.

Hildgendorf* has described the plant in the following terms:—

"*Psoralea pinnata* is found at Coromandel and at various places on the Auckland Peninsula, where it is spreading in a somewhat threatening manner. It is an evergreen shrub, growing 3 to 5 feet in height. The leaves have two pairs of leaflets, and the flowers are blue, single, and shaped like those of a bean or pea. It grows only in warm climates, and is a native of Cape Colony. It grows in patches on rich flats and among the secondary bush growth on rough, second-class clays. From a distance it often looks like a dense plantation of *Pinus radiata.* Fire kills it, but it spreads rapidly on old burns. The plant certainly needs watching, and where single plants appear it would be well to cut them out before the weed becomes established."



Left.—A close-up of a flowering plant of *Psoralea pinnata. Right.*—The plant in bloom.

The above description, written 15 years ago, when probably little was known of the plant, is still substanti-

Young plants growing among tea-tree.

* Weeds of New Zealand, by F. W. Hilgendorf, M.A., D.Sc. P. 112.

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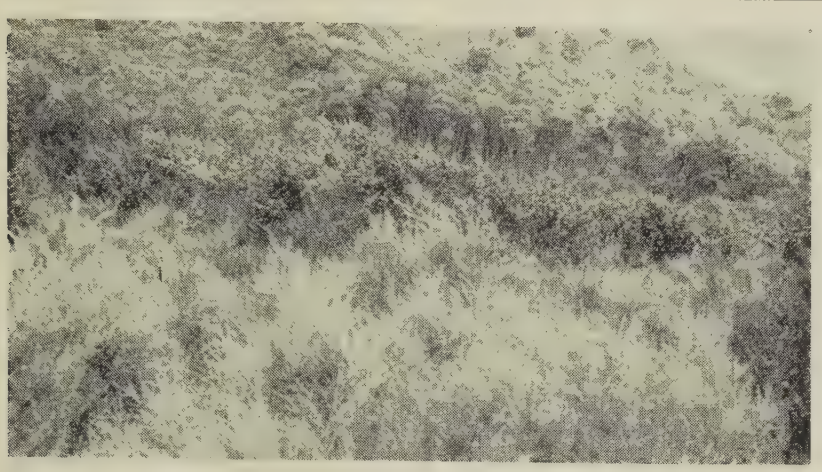

Vigorous growth in tall scrub. Note the solid block in the middle distance and odd plants through the scrub in the background.

ally correct. However, an amendment is necessary to the size given. At present there are individual plants ranging to 20ft in height, while stems may be as much as 6in in diameter. When growing in dense formation, stems run up without branches, but individual plants in open spaces tend to be shrub-like. The rooting system is practically restricted to a substantial taproot, which penetrates well into the soil.

In the Coromandel area quite appreciable areas of this plant have become established on the poorer clay hills, where it is competing successfully with teatree and other second growth. There is ample evidence, however, that the plant will flourish on the better soils, and it is on such areas that the greatest nuisance will be caused.

The plant does not appear difficult to kill, as chopping or grubbing has been quite satisfactory in its control, but it seeds freely, and constant attention will be necessary to limit its spread.

On the credit side it may be mentioned that the stems make quite good firewood, and it is always cut for that purpose where it occurs in a block of teatree.

Unfortunately, however, its virtues in this direction do not outweigh its potential danger as an invader of good farm lands. Consequently, the policy to adopt in respect of this plant should be one of relentless attack until eradication has been achieved.

—C. WALKER, Instructor in Agriculture, Thames.

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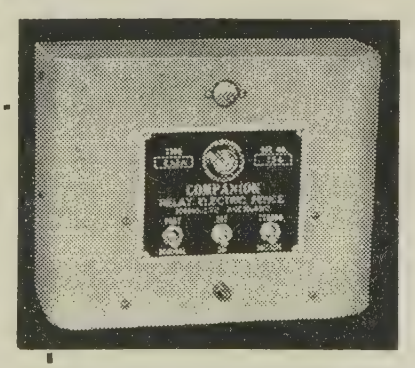

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Striated Clover

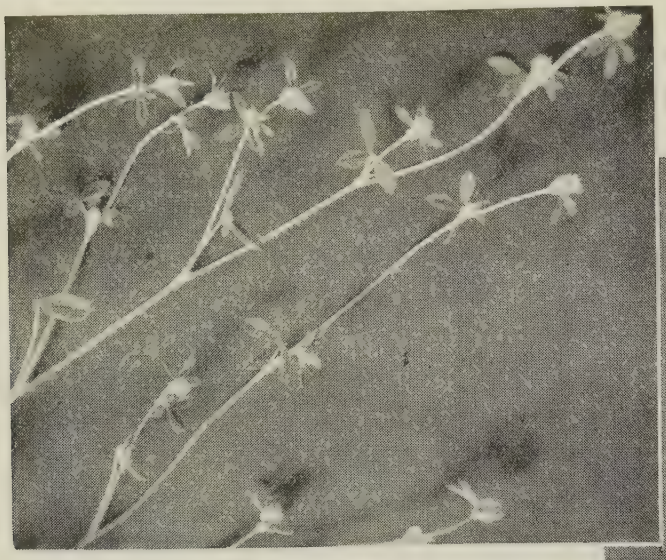

Fig. 1 (above).—Striated clover *(Trifiolium striatum).*

Fig. 2 (right). — Haresfoot trefoil (*Trifolium arvense*).

[*N. Lamont, photos.*

CLOVER growth in the Wairarapa during the past spring has been quite exceptional, and prominent on all but the better quality country has been the little annual clover *T. Striatum* or striated clover. Its prominence has given rise to a large number of inquiries, concerning its name and value as a pasture plant. The illustration (Fig. I) is clear enough for people to recognise the plant, which at this time of the year is stalky and bears pink flowers.

The clover is to be found throughout the hill and light country of the Wairarapa, and no doubt is of some value. However, country growing striated clover will also grow subterranean clover, which is infinitely superior and which will dominate striated clover if sown and topdressed.

Although quite easily distinguished at this time of the year, striated clover looks quite a different plant during the winter and early spring while still in a rosette stage. Its leaves are then not pointed but heart-shaped, and when, as occasionally is found, there are brown streaky marks on the downy leaves, it is very easily confused with subterranean clover. It is also sometimes confused with the less common haresfoot trefoil (Fig. 2), but at this time of the year the typical soft, downy seedheads of the latter, placed as they are on relatively long stalks, make identification quite simple.

—N. LAMONT, Instructor in Agriculture, Masterton.

Destruction of Ratstail in Pastures

BECAUSE of its tough and unpalatable growth, and because it wears the teeth of grazing stock faster than any other grass, ratstail is rightly regarded as one of the worst of the weed grasses, and is considered to be much inferior even to danthonia in feeding value.

Ratstail is now fairly widespread, and is found growing as far south as Marlborough. Generally, it is a weed of poor land, but throughout considerable areas of North Auckland it is found competing strongly with ryegrass, and on certain classes of land

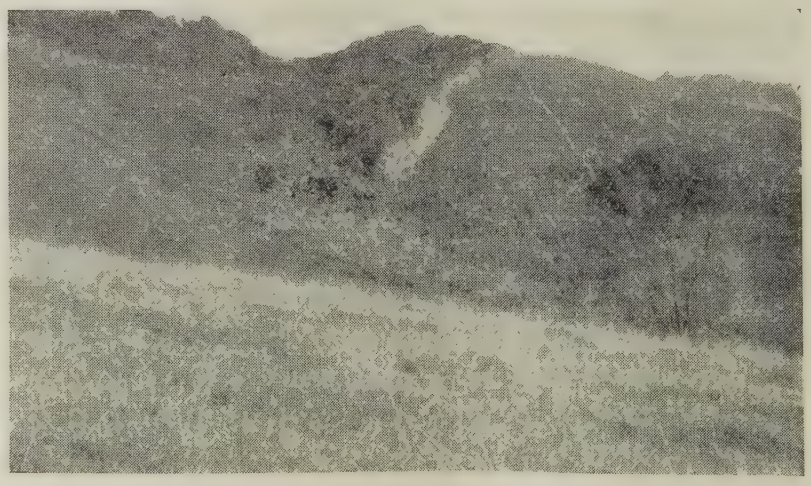

Fig. 1.—A ratstail infested paddock on Mr. Aitkenhead's farm, not yet treated.

topdressing. On some of the coastal it may displace ryegrass even under soils the ratstail has proved exceedingly troublesome, eventually becoming so thickly established as to cause farmers to plough up infested land with a view to resowing.

That the weed can be practically exterminated within two years without ploughing has been the experience of Mr. V. E. Aitkenhead on his coastal farm near Parakai. On this farm, certain fields had become practically ratstail-dominant, and Mr. Aitkenhead was seriously considering a policy of ploughing and regrassing. Before resorting to this, however, he decided to see just what could be done by appropriate management.

As soon as the seedheads began to appear he mowed over the affected area. This was followed by frequent drastic harrowings, and in the autumn the area was again close-mowed. Hay was then fed out during the winter and the field heavily stocked to keep the ground well trampled. Under this treatment, combined with generous topdressing twice each year, the ratstail was almost completely suppressed by the second year, and its place was again occupied by a vigorous growth of ryegrass and clovers.

Fig. 2.—**A few years ago this field was even more badly infested than that shown in Fig. 1. Following the treatment described, it is now an excellent rye-clover pasture, and the ratstail has almost completely disappeared.**

Profiting by this experience, Mr. Aitkenhead is now dealing with each of the badly-infested fields in turn, and he is quite confident that he has at last found a simple and effective solution to what he at one time regarded as an extremely serious problem.

—P. S. SYME, Instructor in Agriculture, Warkworth.

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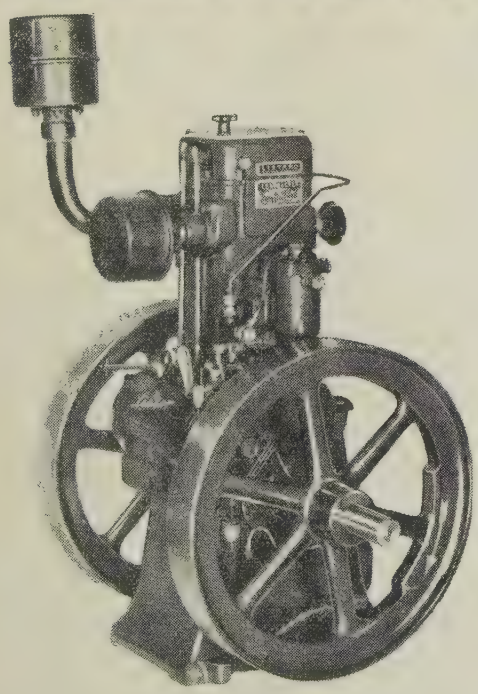

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AGENTS THROUGHOUT NEW ZEALAND

The Orchard and Vineyard

Contributed by the Horticulture Division

Marketing of Fruit for 1941 Season

Orchard Is Essential For Successful Distribution

By J. H. THORP,
Fruit Standardisation Officer.

THE main harvesting season for apples and pears in the Dominion extends over March, April, and May, during which time it is expected that at least 2,300,000 bushels of fruit will be harvested. While a definite quantity of mid-season varieties of apples and pears will be graded and packed and placed in cool storage for distribution during the latter months of the year, a portion of them will be placed on the market as they become available to meet the immediate consumer demand.

There will still remain at the end of May the balance of the mid-season varieties, and also the later varieties for which no cool storage space is available. It is estimated that the quantity of fruit involved will be about 600,000 or 700,000 bushels. This fruit will be needed for distribution during June, July, and August.

Holding the Fruit

One of the problems confronting the Internal Marketing Division is how and where to hold this large quantity of fruit to the best advantage in the interests of all concerned. There appear to be two alternatives. The first is the packing and delivery of the fruit to inspection points as it is harvested, and the second is the harvesting and holding of the later varieties suitable for holding in orchard storage to be packed up later as required by the Marketing Department.

The first procedure would result in a heavy accumulation of stocks at assembly points, which it would be impossible to cope with before deterioration of the fruit sets in. This would necessitate repacking the fruit, with all its attendant difficulties, loss and dissatisfaction to retailers and consumers alike.

The second alternative recommended by the Internal Marketing Division—namely, to encourage growers to hold suitable varieties according to district in orchard storage unpacked—appears to be the only satisfactory method of dealing with the position. This procedure was followed last season to some extent, and proved fairly satisfactory to both the growers and the Marketing Department. With the wholehearted co-operation of fruit growers in all districts, it can be extended to the advantage of all concerned.

Before the Government purchase scheme, growers fully realised the necessity to spread the distribution of the better-keeping varieties, and it was not unusual to find lines of fruit which had been held on growers' properties on the markets in sound edible condition and realising payable prices as late as the end of August.

Care in Picking

To obtain the best results, careful attention should be paid to the picking of the fruit, which should not remain on the trees longer than necessary to obtain full maturity without undue ripeness. The length of storage life in apples depends to a great extent on what storage facilities are available on the individual orchards. Packing sheds which are situated in a shaded position may be utilised to advantage, but care must be taken to stack the fruit in the coolest part of the shed. Excessive draught should be avoided to avoid shrivelling in the fruit.

In many instances advantage may be taken of the shelter belts surrounding the orchards by selecting a position where the fruit will be shaded from the sun.

Where convenient, the fruit should be carted into the packing shed for grading before orchard storage. If the fruit is sized and graded and then stacked conveniently, it will enable the grower to deal with the larger or smaller sizes at will.

The deterioration in the larger sizes is usually the most serious, and those should be packed out first. The smaller sizes are more subject to shrinkage and shrivelling, and should be kept under close observation. The Sturmer variety is liable to become affected by shrivel sooner than most others.

Where it is more convenient to store the fruit adjacent to where it is picked and to avoid carting it to the packing shed for grading and sizing, it should be possible, without incurring any great expense, to sort the fruit into three sizes—large, medium, and small—at the same time eliminating all defective fruit. At packing time it will then be easy to select any of the particular size groups to be graded out as desired without having to go over the whole range of sizes to obtain those required.

The storage cases should be lined with newspapers to exclude drying winds, which induce shrivelling, and it will also keep the fruit clean during storage.

Stacking

Care should be taken when stacking to see that the cases fit closely together to prevent rodents attacking the

fruit. It is suggested that, when stacking, each case be neatly covered with a lid before the next case is placed on it, and to bind the stack together the cases in each succeeding row may be so placed that they rest half each on the two cases in the row underneath. The top cases in the stack should have the lids lightly tacked down, and the stack should be covered up with suitable material to exclude the weather. This covering may be of galvanised iron, waterproof paper (without odour) such as used by builders underneath roofing iron, suitable brush, such as manuka, or a combination of any of the above, the aim being to keep the fruit cool during the warmer weather and reasonably dry during the wetter periods.

To prevent undue weathering and staining of fruit cases, which in most instances will be needed for packing the fruit for marketing, it may be necessary in exposed situations to protect the outside of the stacks in a similar manner.

The above are a few practical suggestions put forward for the consideration of growers who may be looking for some guide on the subject in the hope that the information may be of assistance in preventing undue wastage beyond that which the orchard storage increments are designed to cover.

Fruit in orchard storage should be examined at regular intervals, and on no account should it be held beyond the stage when it can reasonably be expected to stand up to the necessary transport and retain its condition until it reaches the consumer.

Orchard Notes

Preparations for New Plantings

WHERE new plantings or the extension of the orchard is contemplated, a few further notes may not be out of place. Past failures may, in some measure, be traced to one of the following:—

(a) Planting in soil which is too poor to sustain trees sufficiently large to produce regularly good crops of fruit.

(b) Selecting land which is very exposed to strong winds, and where it is almost impossible to establish adequate shelter.

(c) Planting steep slopes which may be subject to erosion.

(d) Planting in soils which overlie a hard pan, which under almost any methods of treatment would be unsatisfactory.

(e) Planting on land which is wet and cannot be successfully drained.

Let us examine these points a little more closely in their respective order:

Fig. 1.—A Jonathan apple tree 26 years old in the orchard of Mr. H. T. Pattie, Gate Pa, Tauranga. The estimated crop is 15 bushels or more, and is typical of all the Jonathan trees in the orchard. The fruit is of high quality and appearance.

Fig. 2.—A Jonathan tree 25 years old in another orchard, with an estimated crop of about 5 bushels. This tree is about the average of Jonathan trees growing in most orchards, and is perhaps above the average trees generally seen.

(a) Although it is admitted that some poor soils will produce high-quality fruit, this seldom (if ever) compensates for quantity, which can be obtained provided the soil chosen is well supplied with nitrogen, potash, and phosphoric acid. One of the principal elements of all plant life is organic matter.

(b) Most fruitgrowing districts in the Dominion need reasonable shelter;

Fig. 3.—Staymans Winesap apple tree 12 years old in the orchard of Mr. C. Hallett, Marata. The crop is estimated at 12 bushels. The tree is exceptionally well grown, and has been pruned on the long leader system. It has responded to good cultural treatment, and is growing in suitable soil with adequate shelter.

otherwise considerable damage may be caused by wind and much fruit lost, in addition to injury to the trees.

(c) Steep slopes are most undesirable, as they are liable to erosion during periods of heavy rainfall, and much of the soil may be taken into the gullies below and the slopes left almost bare. In addition, the labour in all orchard operations is more laborious and difficult. Therefore, gentle slopes or level land is most desirable.

(d) Where hard pans exist—even where the soil is reasonably good—it is not suitable for fruitgrowing. The pan could be broken up, but it may revert to its former condition, so that land of this nature should be avoided.

(e) As most fruit trees require well-drained soils, the greatest care should be exercised to avoid any land which is not adequately drained or cannot be drained satisfactorily.

In order to illustrate what fruit trees are capable of doing when the right type is selected and have been planted in suitable soils under good management, it is advisable to refer to the accompanying photographs, which were taken during the past month.

Fig. 1 shows a Jonathan apple tree 26 years old in the orchard of Mr. H. T. Pattie, Gate Pa, Tauranga. The estimated crop is 15 bushels or more, and is typical of all the Jonathan trees in the

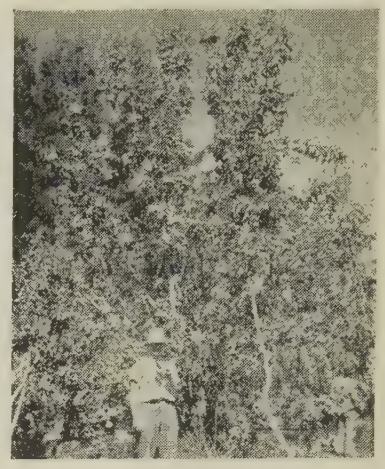

Fig. 4.—A well-grown pear tree (Beurre Capiaumont) 25 years old growing in the orchard of Mr. A. P. Baker, Te Puke, with an approximate crop of 20 bushels of marketable fruit.

orchard. The fruit is of high quality and appearance.

Fig. 2 shows a Jonathan apple tree 25 years old in another orchard, with an estimated crop of about 5 bushels. This tree is about the average of Jonathan

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Fig. 5.—A block of well-grown Delicious apple trees seven years old in the orchard of Mr. E. H. Rumming at Rotorua.

trees growing in most orchards, and is perhaps above the average trees generally seen.

Profit and Loss

The following figures are striking evidence between profit and loss in fruitgrowing:—

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No. 2, 5 bushels at 2s 6d per bushel nett, equals 12s 6d.

Difference, £1 5s.

In orchard practice it is usually considered that the cost of all the operations, such as cultivation, pruning, spraying, and overhead costs, etc., are very little greater whether the production is five or 15 bushels per tree. If this is placed at 5s per tree, it reduces the amount to £1 in favour of tree No. 1. The picking charges, however, are higher, and this can be set at 4d per case for the extra 10 bushels, making 3s 4d, and this reduces the extra returns to 16s 8d per tree, or, with 130 trees per acre, more than £100 per acre in favour of No. 1.

Such facts should leave very little doubt in the minds of fruitgrowers that some of the fundamental points in the past have not been considered sufficiently before planting.

Fig. 3 is a Staymans Winesap apple tree 12 years old in the orchard of Mr. C. Hallett, Matata, and the crop is estimated at 12 bushels. The tree is exceptionally well grown, and has been pruned on the long leader system. It has responded to good cultural treatment, and is growing in suitable soil with adequate shelter.

Fig. 4 shows a well-grown pear tree (Beurre Capiaumont) 25 years old growing in the orchard of Mr. A. P. Baker, Te Puke, with an approximate crop of 20 bushels of marketable fruit.

Fig. 5 shows a block of well-grown Delicious apple trees seven years old in the orchard of Mr. E. H. Rumming at Rotorua.

Fig. 6 shows a block of Ballarat apple trees, also seven years old, in the same orchard.

These trees have done remarkably well, and have established a strong framework which in a few years will be capable of bearing a very heavy crop of fruit.

Points for Noting

A few points worth noting are:—

(1) APPLES do best in moderately heavy, friable soils over a friable clay subsoil.

(2) PEARS require deep, moist, well-drained soil.

(3) PEACHES AND NECTARINES do best in a good, open loam, but will do in almost any well-drained soil.

(4) PLUMS grow in quite a wide range of soils, which must be well drained.

(5) CHERRIES require a deep soil with good natural drainage.

(6) QUINCES are fairly hardy, and will thrive in low, moist soil, but not in wet situations.

Anyone requiring land suitable for fruitgrowing should be careful of orchard land schemes in which the work and oversight are all provided in advance.

Fruitgrowing by proxy is hardly ever profitable, as there are special difficulties by that method, or rather lack of method. It may be alluring to anticipate an orchard which has been cared for by others waiting on retirement from active business. Orcharding by others is rarely profitable, as the costs accumulate rapidly and the risks are heavy. The following sums up the position:—"It is certain that if one is to make a good business of fruitgrowing, he must devote his best energies to it. Other things may wait, but not the orchard work. He must have a 'feeling' for fruit more than other things, and it must have first call on his time and energy. If he does not have this feeling he does not possess the essentials of a fruitgrower."

Seasonal Operations

All late varieties of apples and pears will need gathering and preparing for the market.

Look well to all drains in readiness for the coming winter months.

Where thought desirable, stone fruits could receive a late autumn application of Bordeaux 5-4-50. If San Jose scale is in evidence an application of lime sulphur 1-30 would assist in control.

If surface water is liable to collect in orchards, the land should be turned over with the plough after harvesting is finished, throwing the soil up to each row of trees and leaving an open furrow in the centre of each bay. Stagnant water during the winter and early spring is very detrimental to fruit trees.

—L. PAYNTER, District Supervisor, Auckland.

Fig. 6.—A block of Ballarat apple trees also seven years old, in the same orchard.

Citrus Notes

Mr. Greig Discusses the Control Of Citrus Diseases in the Orchard

"HULLO, Mr. Smith, how's the job going?"

"Oh, quite well, thanks. Tidying up those lemon trees has been a bigger job than I imagined. Several of the trees have got small holes right in the main trunk, and the smaller twigs are often dead, and when broken open I find a white grub inside. What's that?"

"That's the citrus-borer, Mr. Smith, and it causes considerable damage in certain areas, and especially wherever there is dead or dying wood in a tree. That's why I suggested you begin by pruning out such wood and also by opening up your trees a little. The citrus-borer is a native long-horned beetle, the female of which lays its eggs in such dead wood. The young hatches out as a larva which bores down the living wood of the tree, killing the twig or branch as it goes. If you catch it before it has entered a main limb, the twig can be pruned off and burnt. If not, the only thing to do is to get a benzine injector, which is like an ear syringe, and squirt benzine down the hole. After that the hole must be plugged with a petroleum jelly. The benzine fumes kill the larva."

"One or two of the largest trees, Mr. Greig, look more yellow than the others. Do you think there is anything wrong with them? I've already pruned the dead wood out, and there doesn't seem to be much borer in them."

"The first thing I would think of is bark-blotch. With a sharp knife test the bark on the main trunk, especially where it appears to be flaking off. If the bark is dead and there is practically no gumming, it is probably bark-blotch. If, however, there is gumming and there is a disagreeable odour associated with the discoloured bark it is probably collar-rot. In either case treatment is the same—cut out all infected tissues. This must be done thoroughly, and make sure that you reach clean, healthy bark all round. Burn the affected material and paint over with Bordeaux paste or acidulated mercuric chloride and a bitumen paint. If it is collar-rot, drainage must be improved, but it is more likely to be bark-blotch."

"What do you mean by Bordeaux paste and your other recommendation?"

"Bordeaux paste is prepared from bluestone or copper sulphate and quicklime or calcium oxide. The formula is 1 lb. of bluestone, 2 lb. of quick lime, 1½ gallons of water. Dissolve the bluestone in half the quantity of water, and slake the lime with the remainder. When slaking has ceased stir the lime mixture into a stiff paste, at the same time slowly adding the bluestone solution. Apply the mixture with a brush. The acidulated mercuric chloride is corrosive sublimate 1 part in 1000 parts of water, to which 10 parts of concentrated hydrochloric acid has been added. The bitumen paint is a proprietary preparation with a bitumen base prepared as a quick-breaking emulsion which does not injure bark and remains in a plastic condition for three years. A petroleum jelly has also been shown to give good results. Now, what about that other two acres which can be broken in for an orchard? You should start work on it this autumn. The thorough preparation of the soil before planting is one of the most important keys to success in citrus culture."

A lemon tree affected with bark-blotch recovering after treatment.

"What would you suggest—ploughing, discing, or rotary hoe?"

"For original turning up I think the area should be ploughed to a depth of 6 inches and left to fallow over this winter. Plough right up to the boundaries, as we shall have to plant shelter this winter, and remind me to discuss the ordering of trees next month. Just one other important point. Don't forget to put on your autumn Bordeaux this coming month. Last year down in Gisborne the damage caused by citrus brown-rot was extremely severe in some orchards. The fruits turn a light brown and emit a pungent odour, and there is also the risk of healthy fruits being infected after picking by diseased fruit, thus resulting in losses in the curing shed as well as in the orchard. When a severe attack is noticed it is generally too late to save the crop, so take no risks and put on a 3-4-50 Bordeaux during May. Brown-rot is a fungous disease, and thus requires preventive measures.

—A. W. M. GREIG, Citriculturist, Auckland.

Cool Storage Notes

Stacking of Fruit in Cool Storage

IN order to obtain the best results with fruit which is being stacked in cool storage chambers, supervision of the stacking of fruit is necessary. The careful spacing of cases of fruit in cool chambers to meet the requirements of the system of cooling and the direction of the air circulation will facilitate cooling and ventilation, thereby assisting the refrigerating plant in the removal of heat and gases from the fruit. Rapid cooling is essential when healing with pears.

When fruit has been carefully stacked in a cool storage chamber there are three important factors which have an effect on the length of its cool storage life. They are:—Temperature, humidity, and ventilation. The pear and apple temperature charts which were published in the January and February

issues of the "Journal of Agriculture" indicate the temperatures and relative humidity that have been found to be suitable for the holding of pears and different varieties of apples in cool storage.

Ventilation should be carried out at regular intervals, at least twice weekly for short periods. An improvement in the out-turn of the fruit held in cool storage can be obtained only by a careful and methodical attention to these important factors.

Daily Log

A daily log or record of the details of the running of the refrigerating plant cool chamber temperatures, etc., should be undertaken at the beginning of each day's run. The entries should be accurately recorded, and the daily log should be available for inspection by any authorised officer.

The following is a specimen of a daily record which should fill the requirements:—

The first chamber temperatures recorded in the log each day should be taken before starting the refrigerating plant or air circulating fans, as this reading will be the maximum rise in temperature which has taken place in the chamber since the refrigerating plant was stopped after the previous run.

—A. POWELL, Cool Storage Officer, Wellington.

Viticulture

Points in Making Cider

IN the production of large commercial quantities of cider the use of a centrifuge is to be highly recommended. This machine obviates much labour entailed by racking, and checks fermentation by removal of the heavy

DAILY LOG OF FRUIT COOL STORE.

Date .....

Name of Cool Store ....

Location .....

HP. LP.

Engine or Motor Started.	Engine or Motor Stopped.	Hours Run.	Compressor Started.	Compressor Stopped.	Hours Run.		

Cool Chamber Temperatures.

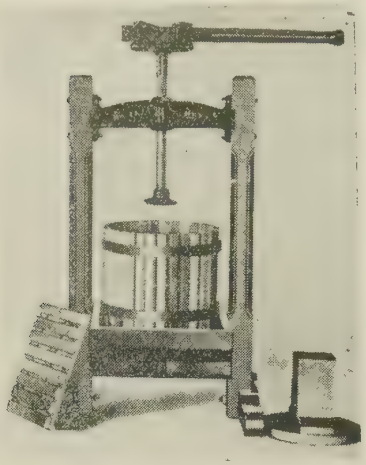
Time at which taken.	Chambers.						Fruit Receipts and Deliveries.
	1	2	3	4	5	6	No. of Cases Received:
							No. of Cases Delivered:
							No. of Cases in Store:

Relative Humidity

Remarks (*)

Engineer's Signature .....

Note: (*) Actual time of blowing out or ventilating of chambers should be recorded.



A small hand type of grape press adaptable for apples.

yeast cells. The low nitrogen-content of the liquor left is not a suitable medium for the further growth of yeast, and the cider is therefore stabilised. There are a number of makes of this type of machine, and names of makers and agents are obtainable from the Department.

Blending

As has already been mentioned, a considerable amount of blending is done by mixing different varieties of apples before milling, but only those apples which are in a fit condition to be ground at the same time are blended. Other varieties ripening at other periods are also blended in their turn. It is evident that these different blends will produce finished ciders differing from each other in flavour and their general constituents. The general public do not appreciate these differences, but look for a uniform article when purchasing their cider regularly from the same cellars. To comply with these conditions it is necessary to meet the customer's taste as far as possible by blending the ciders of different periods, so that a uniform cider can be delivered for one year at least. Special blends can also be made to produce better cider than the bulk, to be sold at a higher price. This naturally calls for a first-class palate and some experience.

The art can also be utilised in small cellars by blending ciders having a preponderance of certain constituents such as acidity, with ciders lacking in acidity. Care should be taken, however, that none of the ciders to be blended is diseased. A common mistake in this relation is to mix ciders having a vinegar taint with sweet cider in the hope of diminishing the defect, the inevitable result being that the taint is communicated to the whole of the blend.

Blending should be done some time before the cider is ready for bottling, when the Baume hydrometer records about 5 degrees. The length of time between blending and bottling should be at least 14 days but not more than one month. The mixing of the ciders stimulates the action of the ferments, and will necessitate an extra racking when the fermentation calms down. For this reason it is useless to filter before blending.

Filtering

In commercial cideries it is the practice to filter all ciders directly before bottling so as to produce a bright, uniform article. Several filterings are sometimes necessary to attain this object. The effect of filtering on those qualities which appeal to the palate is disputed. English and German authorities claim an improvement, while the leading French authorities claim the contrary, although they agree that filtering is advisable for ciders which do not clear after several rackings.

There are several types of filters, the filtering-material used being generally cellulose or asbestos arranged in heavily tinned frames or drums. The cider is forced through the filter by hand or a power pump, and does not come in contact with the air. The price of effective filters is unfortunately too high to justify their being employed for filtering small quantities. A closely woven muslin bag filter, pre-coated with either prepared asbestos or Keeselguhr filter aid is reasonably fast filtering and not expensive. A suitable set-up is illustrated, and details will be found at the end of this bulletin. The old felt bag filters are effective so far as clearing goes, but the process is too slow, and they expose the cider too long to the oxidising influence of the air and probable infection by vinegar bacteria.

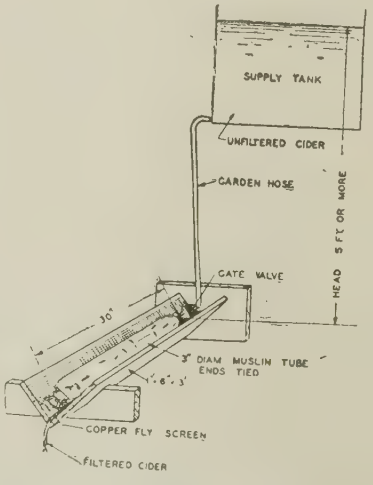
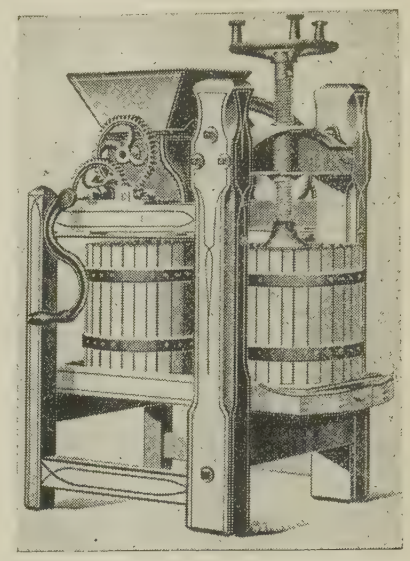


Diagram of a home-made filter.



An orchard type combined mill and press made for grape crushing, but adaptable for apples.

Pectic cloudiness often gives considerable trouble in the making of cider. Some varieties of apples contain more pectase than others and are able to clear more easily, as pectase is an enzyme which coagulates pectin and thus eliminates any undesirable excess. Some varieties of pears contain an excessive amount of pectase, and, as previously stated, it is often advisable to blend a proportion of such with faulty apples.

In the making of the cider it is possible to eliminate the excess pectin before fermentation by the action of a calcium salt, which has the property of coagulating pectin. A well-known authority on cider recommends the addition of calcium sucrate in small quantities, and after settling down over night, the clear juice that lies between the sediment and the scum is racked to the clean fermenting vat or cask to ferment. The calcium salt, having precipitated the pectin and thus served its purpose, is itself precipitated by the fruit acids, while the small amount of sugar which was used to make up the calcium sucrate is fermented into alcohol.

The calcium sucrate solution should be prepared as follows:—

(a) Dissolve 10 lb. sugar in 3 gallons water.

(b) Slake 2 lb. good quicklime in one gallon water.

Pour (b) through a sieve into (a), stir thoroughly and make up to 5 gallons with water. Allow this to settle and then rack off the clear solution.

This solution is used at the rate of ½ to 1 gallon of the sucrate solution to 100 gallons of apple juice to be depectinised.

It is also recommended to delay the addition of any tannin until after this treatment, as the tannin holds the pectin in solution and thus impedes the coagulation.

—*B. W. LINDEMAN, Vine and Wine Instructor, Auckland.*

(To be continued.)

Seasonal Notes

A WORD of warning must be issued to winemakers who have this year produced light dry wines of hock and claret types. Some vignerons are inclined to forget to keep these types of wines continually topped up as soon as their fermentation ceases. Some thousands of gallons of dry wines are lost at times through acetification, and to avoid these losses this type of wine should never be stored in containers which are not full, and topping up must be practised every week. Less-frequent topping-up is not sufficient as evaporation is considerable.

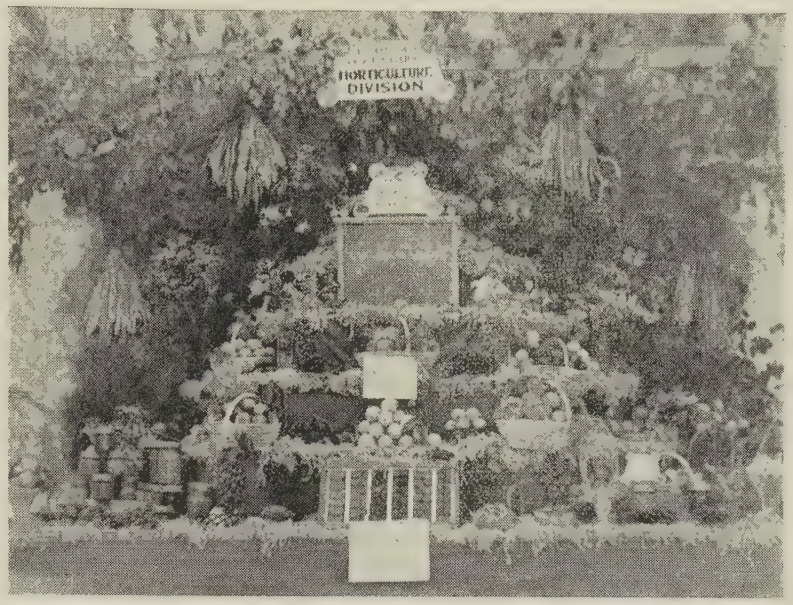
In the sweet wines, fermentation will, in most cases, continue for some months yet, and it is necessary to make a careful watch and check upon sugar strength and Baumes in order to allow an absolute maximum of alcohol to be fermented by the yeast. Fortunately, we have in this Dominion a very vigorous type of natural yeast from the grapes, which is capable of fermenting up to and over 30 per cent. of proof spirit in our wines, and it must be remembered that the higher alcohol strength we can produce through fermentation, the less fortifying we have to do. This is a major economic consideration.

By the addition of sweetening sugar in two or three separate lots, allowing in each case for the fermenting must to drop to 5 Baume, a far better control over their temperatures can be obtained and a sounder wine will result. By allowing musts to increase too high before allowing them to ferment, extremely high temperatures disastrous to the production of sound wine will be created.

In some wineries it will be found that wines become "stuck" at a certain Baume, and it then becomes necessary to re-start the fermentation. This is best done by adding to this "stuck" wine a sound, active, and healthy fermentation from an already fermenting vat. It is also advised in some cases to use yeast stimulation by ammonium phosphate at the rate of 1 ounce per 100 gallons. However, with the use of ammonium phosphate, great care must be taken to see that the must is free from any foreign bacterial activity.

Practically all New Zealand grapes tend to suffer from an excess of acidity more than a lack of it, and it should not, in any circumstances, be necessary to acidify any must for the production of wine. In the production of distillation wash, however, in which the skins of the grapes after pressing and even sometimes after having been fermented, are thrown back to vat, the bulk being made up of water and sugar, acidifying becomes necessary to obtain a healthy and vigorous fermentation, otherwise the fermentation of this sugared water will tend to proceed very slowly. The increase in acidity in this distillation wash to about 3 degrees by the addition of 3lb. to the 100 gallons of tartaric acid is recommended in these cases.

—*B. W. LINDEMAN, Vine and Wine Instructor, Auckland.*



The exhibit of the Horticulture Division of the Department of Agriculture at the National Horticulture Show at Oamaru.

Dealing with Sorrel.

R.H. (WELLINGTON).—

As a constant reader of your "Journal," I would like to ask for some information which I hope you will publish in your next issue. I have a patch of ground of approximately 100ft by 10ft, which has been allowed to grow rank with weeds, sorrel predominating. Is there any known method of dealing with the sorrel? I have tried digging it out and liming it, but it comes up again. I have thought of getting some cheap kind of poison, as it does not matter if the soil is affected, but I know of no suitable method.

The other question is about preparing a plot for growing onions. How does one prepare the soil? I have been growing onions on the same patch for six years, and I want to change over to a more sheltered position, the present one being too exposed.

HORTICULTURE DIVISION:—

The continuity of this weed is due principally to neglect of cultivation, combined with the probability of the soil being in a "sour" condition. Liming will be effective in "sweetening" the soil—that is, removing the acid condition existing—and, in conjunction with cultivation, will lead to the disappearance of the sorrel. This weed is seldom prevalent on well cultivated land.

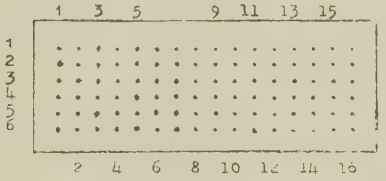
Bulletin No. 69, "The Onion and its Related Species," which is obtainable from the Department, will give you the necessary directions for growing onions.

The Home Garden

Vegetables, Small Fruits and Flowers

Growing Spring Cabbage For Spring Cutting

As part of the plan described in last month's "Journal" for growing spring cabbage for spring cutting, the land should now be prepared for planting. The position selected should preferably be sheltered from the cold southerly winds, and, if low-lying, a raised bed should be prepared which will provide drainage during the winter months. A bed 17 ft. long by 7 ft. wide will provide space on which to grow 96 plants if planted as the following diagram indicates:—



The area of the bed can either be increased or reduced as the gardener desires, but the method of planting remains the same. The rows are 12 in. apart, and the plants the same distance apart in the rows. This may seem close planting—and it is—but the reason for it will be explained later when harvesting is being dealt with.

After digging, and before planting, blood and bone as the fertilising agent should be broadcast at the rate of 1½ lb. per square yard, and, if convenient, a few handfuls of superphosphate—particularly if the land has been well limed—should be mixed with it. This should be well worked into the top two or three inches of soil.

After the ground has been levelled with a rake, lines should be dragged the full length of the bed with a 12 inch marker and then dragged across. This will divide the area into equal distances, and planting will be facilitated by placing the plants at the intersections of the lines.

When removing the young plants preparatory to planting, do not pull them; dig them out. This will conserve the whole of the delicate root system, which is so essential for the quick re-establishment of the plant in its permanent location. If it can be arranged, dipping the plants before setting in a mixture of nicotine sulphate or arsenate of lead, or a combined mixture of both (as previously advised for spraying) would be beneficial by destroying any aphis or grubs which might be on the leaves. The plants may be set either with a dibber or a hoe, but the soil must be well firmed round the roots. Should the soil be dry at time of planting, a good watering will need to be given, but it is better to plant when conditions are moist.

If aphis or caterpillar are noticed, spray the plants as soon as possible. They must be given every chance to grow and remain healthy, and on no account should weeds be permitted to interfere with their development. If at any time weeds cannot be destroyed by hoeing, they can be removed by hand, and, along with any soil which may adhere to their roots, thrown on the compost heap.

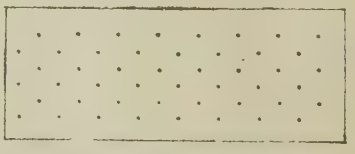
Almost from the time the young plants are set out, their principal enemy is most likely to be snails and slugs. These, however, are easily controlled by frequent dustings of hydrated or air-slaked burnt lime. The applications should always be made at night, when the pests are busy feeding. The lime must not be merely dropped on the plants, but must be thrown outward and downward, so that when it is rising to drift through the air it will contact the underside of the leaves, as it is here the slugs are most likely to be operating. A few handfuls at each application will effectively control the pest—provided your neighbour does likewise.

From four to six weeks after planting a pinch of nitrate of soda should be given to each plant, and should be placed as near the root as possible. It is a good plan to continue this practice every three or four weeks until August, and the fertiliser can be worked into the soil with a small hand gardening fork or a light hand hoe.

Harvesting

In early spring green vegetables are very scarce and most highly appreciated, and as the plants should be fairly well grown the cutting can be started, as every leaf of this variety of cabbage—if it has been properly protected—can be consumed.

Before cutting is started reference should be made to the planting diagram, and in the odd numbered rows only plants under the odd numbers should be removed. Similarly, in the even numbered rows only plants above the even numbers should be cut.



As the bed should appear after the first cutting is completed.

This will allow for future growth and development, and will prolong the period of cutting and consumption. A well cared for bed of Sutton's Flower of Spring cabbages should carry the home gardener through until peas are almost ready.

—D. K. PRITCHARD, Instructor in Vegetable Culture, Wellington.

What to Do in the Home Garden Next Month

Summary of Operations During May

VEGETABLE SECTION.

Successional Sowings.—Nil.

Other Sowings.—Broad beans.

SEEDLINGS TO TRANSPLANT AND PLANTS TO SET.

Endive, spring cabbage and cauliflower. Potato onions (set bulbs half their depth in the soil and 8in. apart in rows 12 to 15in. apart). Shallots are better planted during July and August.

SPECIAL NOTES FOR WARM DISTRICTS.

When frosts are light make a sowing of peas for an early spring picking. This sowing should be made slightly thicker than a spring or summer sowing, and is preferably made on ridges. W. F. Massey is a suitable variety.

Sow lettuce seed and transplant seedlings of previous sowings.

In well-drained, frost-free districts early potatoes may be planted. Arran Banner is a suitable variety and should be planted 3in. deep and 12in. apart in rows 2ft. apart.

PERENNIAL CROPS.

Rhubarb: Plant crowns. Asparagus: Clean up beds if not already done.

CROPS IN SEASON.

(The month in brackets represents the month of sowing the seed).

Salads.—Endive (Jan.-Feb.), celery (Sept.), capsicums (Aug.-Sept.).

Greens.—Beans (Feb. in warm districts), cauliflower (Aug.-Sept.), Brussels sprouts, borecole, winter cabbage,savoy cabbage (all in Oct.), spinach (Mar.), peas (Feb. early dwarfs in warm districts).

Roots.—Artichokes (Sept.), turnips (Mar.), kumaras (lift at this stage), pumpkins (Oct.-Nov.), salsify (Oct.), swedes (Nov.), parsnips (Sept.), leeks (Oct.), celeriac (Sept).

CROPS IN STORE.

Carrots, onions, shallots, kumaras (new season's), pumpkins, pie melons, potatoes.

GENERAL WORK.

Clean up and dig or trench any ground from which crops have been taken.

Dig under Jan.-Feb. sowings of green cover crops. The stage of development of these when maximum goodness is imparted to the soil is when the crops come into flower where the land is light, and at a more advanced stage of maturity where the soil is heavy and requires to be opened up.

Place orders for seed for the coming season.

Earth up leeks and celery.

Remove old and dead leaves from Brussels sprouts.

Set potato tubers to sprout for the early crop.

SMALL FRUITS SECTION.

May is a good planting month in most districts. Such early planting induces establishment while there is still warmth in the ground, and ensures a good start in the spring (see paragraph in this "Journal").

GLASSHOUSE SECTION.

Sow tomato seed early in May for plants for the heated glasshouse.

Planting Small Fruit Plantations

AREAS which are to be planted in small fruits should have been prepared previously. All that is necessary now is to give the ground a thorough surface cultivation, with the object of destroying seedling weeds without breaking the land down to a fine tilth.

During May most of the bushes are dormant and the leaves have fallen. If planted during the month while some warmth remains in the ground, their rooting system will establish itself in the soil, thus enabling the plants to make a good start in the spring. If planting is not done in May it is better left until July.

At planting time a dressing of artificial fertiliser should be given. It should be mixed with the soil when preparing the hole so that the maximum benefit may be obtained for each plant. A dressing of 2 to 4 ozs. of a mixture of nitrogen, phosphate and potash is sufficient for each plant, and should be followed by a further dressing in August.

The plants should be set in the ground at about the level which they grew in the nursery. The roots should be spread, and the ground thoroughly firmed about the plants.

The distances at which the plants should be set are given in the following table:—

Type of Plant.	Distances (ft.) between Rows.	Plants.	Number required per acre.
Currant—Black ..	6-8	3	1815-2420
Currant—Red ..	6-8	4	1380-1815
Gooseberry	6-8	5	1089-1452
Raspberry	6	1-1½	5448-7260
Raspberry (vigorous)	6	3	2420
Raspberry (3 plants on hill)	6	6	3630
Loganberry ..	6	8-12	605-907
Boysenberry ..			

CORRECTION.

In the article on this subject in the March issue part of the spraying programme was incorrectly given as arsenate of lead powder ¼ per cent. to ¾ gallon of water. This should have read: **¼ ounce to ¾ gallon of water.**

Premature Ripening of Oranges

D.S. (THAMES VALLEY):—

I have a large orange tree some 20 years old which bears well and is now carrying a heavy crop of fruit. The oranges are not yet half-grown, and are starting to ripen. Usually they do not ripen until August. The tree was manured with decayed cow manure last spring, and it was also given a quantity of lime. Would you please tell me why the fruit should ripen too soon and what I can do to prevent it?

HORTICULTURE DIVISION:—

The premature ripening of a heavy crop on the twenty-year-old orange tree is probably due to debility. This may be due to the size of the crop, in which case timely thinning out of the fruit would have prevented the trouble and may even now afford relief. However, there are a number of causes which may account for such a condition.

It will be best to ask your district Orchard Instructor to call when in the locality. An inspection will probably enable the cause of the trouble to be located.

APIARY NOTES

Contributed by Officers of the Horticulture Division

Production of Beeswax

ANCIENT writers were of the opinion that bees collected ready-made wax directly from plants and flowers, and that when building their combs from it they merely had to knead the wax with saliva in order to render the substance more pliable when working. This thought was no doubt encouraged by the fact that wax of a kind exists as a vegetable product.

During the sixteenth century, however, it was noticed by a number of observers that the bees did not collect wax from the fields, but produced it themselves in some strange way within the hive. Huber in 1793 began a series of experiments which eventually confirmed the discovery, showing that beeswax was produced from honey in the body of the worker bee, and that it is an organic and not a mechanical production.

Wax-making

To produce wax the bees retain large quantities of honey in their stomachs and cluster together for warmth. The heat obtained in this way reaches a temperature of from 87 degrees to 90 degrees Fahrenheit. In this state the vital chemistry of the bee converts the honey into wax. It is made available for use by its secretion from glands on the underside of the body, and appears as thin scales, which are removed by the legs and passed to the mouth parts, where it is worked and moulded for use in comb building.

The elaboration of wax not only draws largely on the vital powers of the bee, but also requires the consumption of large quantities of honey. This partly explains why the extra amount of wax secretion necessary in section comb honey production is a factor in reducing the honey yield.

Commercial Production

Much more beeswax was produced per colony for commercial purposes before modern methods of beekeeping were introduced, when bees were kept in skeps and boxes or by any other of the primitive methods by which the great majority of stocks were destroyed annually and all combs melted down for wax. Modern methods of apiculture do not require the destruction of a single bee, and combs are extracted clean of all honey and returned to the hives to be refilled. With care, these combs may be used for storage purposes for many years; consequently, the only surplus wax available for commercial purposes is that obtained from cappings, burr-combs and old combs, especially those which have been used largely for brood-rearing.

Prevent Waste

In ancient Greece and Italy beekeeping was of great importance to the farmer, the proceeds of wax and honey forming a valuable part of his revenue. In New Zealand today, however, it is surprising how much beeswax is wasted each year in the majority of apiaries. Many beekeepers either do not realise the amount of wax obtainable from a set of 10 old combs or do not bother to save broken bits, burr-comb, etc., until sufficient has been saved to warrant boiling up.

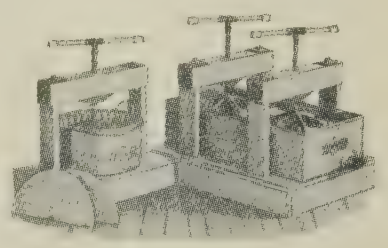
It has been estimated that from 10 lb. to 15 lb. of honey are consumed by the bees in making 1 lb. of wax. The weight of the wax, however, is only a small portion of the total weight of a comb of honey. From 2½ lb. to 3 lb. of wax are usually obtainable from a set of 10 combs when proper methods of extraction are used.

Methods Used

Many different methods are employed for separating wax from impurities, all of which are based on the fact that beeswax melts at a temperature of 145 degrees to 150 degrees F., and that when reduced in boiling water it readily separates from such foreign substances it may contain because of its lighter specific gravity.

Beeswax is lighter than water, its specific gravity being 0.96 as compared to 1.0 of water. Consequently, the two will not mix. Melting old combs in water is therefore the simplest way to secure the maximum amount of wax from old combs and mixed cappings, provided a suitable press is used.

Space will not allow a full description to be given of the various wax presses in use. It may be stated, however, that the "Hatch" press is very efficient and the one must commonly



A root "Hatch" single and double "Hatch" wax press.

used in New Zealand. Full details how to use this press and other types may be obtained by making application to the local Apiary Instructor.

Old Combs

Old combs should be placed in a copper of hot water and gently boiled until all wax is set free. This will not take long if the mass is agitated at intervals until everything is thoroughly broken up, after which the press is brought into use. The secret in pressing is to deal with small lots, screwing down the press a little and often, and keeping the liquid as hot as possible during operations.

Moulding

It is advisable to strain the hot liquid wax and water through a strainer of muslin or sugar sack, otherwise there will be considerable sediment on the bottom of the wax blocks. The liquid may be run into 60 lb. tins with the

(*Continued on page 288.*)

Notes for the Poultry Farmer

Contributed by Officers of the Livestock Division

Beware of Dirty Crates In Marketing Live Poultry

By F. C. BOBBY,
Superintendent of Poultry Husbandry, Wellington.

THE poultry industry of New Zealand can be justly proud of the fact that disease has not obtained a serious hold on their poultry stock. This fact, however, is no excuse for complacency. Intensive and continuous efforts will have to be made to prevent disease from gaining ground among poultry in this country. Present-day birds selected for high egg production are more prone to disease than their lower egg producing ancestors, and any form of neglect by the industry can easily lead to serious trouble.

In this connection the New Zealand Poultry Board has drawn attention to the danger of spreading disease that may be associated with live poultry in auction markets and in particular with the use of dirty crates. It will be clear to every poultryman that once a crate has carried a diseased bird such a crate may become a menace to every subsequent bird placed in it **unless it is cleaned and disinfected after contamination.** Thus, dirty crates which may have contained an unhealthy bird and been used between farms and markets are a serious source of danger in the ease with which they may spread disease. In order to reduce this danger to a minimum care should be exercised by both producer and market agent. Steps are being taken to warn all parties concerned that **greater care must be taken in the future.**

Many agents supply suitable crates for live poultry, but in the rush of transferring birds into and out of markets at sale time these crates are not cleaned out and disinfected as often as is desirable. Agents have been asked to watch this point, and poultrymen are asked to co-operate by refusing to move birds in dirty crates. It has been noted that producers often use makeshift crates of their own. More often than not, these are unsuitable for live poultry, and, in addition, are left in a dirty condition. For their own good, poultrymen thus offending should remedy this state of affairs.

Thus, all poultrymen transporting live poultry in crates are asked to read carefully and to act upon the following recommendations:—

(1) **Never send unhealthy birds—including those suffering from colds—to an auction market.**

(2) Clean out and disinfect **any** crate, whether your own or the property of an agent, before dispatching birds from the farm.

(3) If using your own crates, see that they are clean and suitable for transporting live poultry.

(4) **Don't overcrowd any crate.** This leads to dirty conditions and often deaths from suffocation.

(5) If you keep crates on the farm, whether your own or the property of someone else, put them under cover. Rain soaks the litter and wood, thereby setting up conditions favourable to disease organisms.

(6) Co-operate with market agents in seeing these common-sense recommendations are carried out. Take the long view—they are for the good of the industry in the future.

(7) Communicate with the Government Poultry Instructor for your district when you meet difficulty in obtaining clean and suitable crates from agents for dispatching live poultry to a market. He will do his best to help you.

Management for Egg Production

SATISFACTORY winter egg production depends primarily on pullets hatched at the right time of year and allowed to mature naturally without being forced into early production. Generally speaking, light breeds, such as White Leghorns, give the best results when hatched in September, while August hatching appears to be the best for the heavy breeds, which are slower maturing than the light breeds. Such flocks, when housed and managed properly, should prove profitable to their owners.

Care in Handling

The good work done in hatching and rearing sound healthy flocks of pullets is often undone by careless handling, due in many cases to lack of experience. A common mistake is that of making abrupt changes in housing or feeding. Any change in housing should be made before pullets begin to lay, thus allowing them to settle down in good time, while any feeding changes should always be made as gradually as possible. Pullets are easily upset in the autumn and winter, for which reason any alteration in their general management should be put into practice before they begin to lay or, alternatively, left until the spring, when possible, as the birds are not so liable to be upset at that time of year.

BIRDS THROUGH MOULT YET?

With the high cost of grain and winter in the offing, every unnecessary day your hens linger in the moult is costing you real money. So why let them loaf along, eating their heads off, when they should be contributing to your Autumn profits here and now? Get them through the moult and into laying trim in double-quick time by feeding Karswood in the mash daily.

At small cost, you'll gain many times over in the extra eggs received and have a healthy virile flock in excellent fettle for continuous laying through the coming cold weather. That Karswood is a **safe** tonic of very definite benefit to moulting fowls is proved in the following letters from users:—

MOULT QUICKLY OVER

"I have been keeping poultry for seven years, and six years I have given Karswood Poultry Spice in the mash during the moulting season. The year that I didn't use your Karswood the fowls were 14 to 16 weeks in the moult. But there was a great change in the ones that had Karswood Poultry Spice, as they were through the moult and laying in six weeks. I have been well repaid for using your Karswood Poultry Spice.—A.M.

A GREAT HELP TO MOULTING BIRDS

"I am a constant Karswood User. When birds are moulting, a little in the mash gives them that 'little extra,' helps them along and brings the birds into lay as soon as possible. Karswood is a great tonic, which is why I put my faith in it to produce my eggs."—J.C.

LAID DURING MOULT

"I have no hesitation in saying Karswood Poultry Spice is extremely beneficial to moulting birds, and have noted how much less seedy and off-colour they are when kept on their Karswood ration during this period. I had some fowls lay practically all through the moult last season, and was never without eggs all winter. Two White Leghorns especially were noticed, which were laying when their new feathers had started to come and yet were in quite good condition."—A.M.

MOULT MAKES NO DIFFERENCE— STILL LAYING REGULARLY

"I have 26 hens, and since giving them your Karswood Poultry Spice they have doubled their output of eggs and all of them are still laying. Five of them are half-way through the moult, but it has made no difference to them, as they are still laying regularly. I think this is ample proof of the value of your Karswood during the moulting period."—S.J.

(Original letters on file for inspection.)

Karswood is obtainable: ½ lb. packet, 1/-; 1 lb. packet, 2/-; 7 lb. tin, 12/6.

KARSWOOD
POULTRY SPICE

Shortens the moult and increases egg-production without forcing, because it contains ground insects, but no cayenne pepper, etc.

Overcrowding

In many cases pullets are carried on for the season in the houses in which they were reared. This is quite a good arrangement, but it is often advisable to thin the numbers down by removing all cull and backward pullets from the more forward ones to avoid any danger of overcrowding during the winter period. A safe rule for numbers is to allow 4 square feet of floor space per bird for flocks of 50 and more. Flocks of less than 50 will need a bigger allowance, say 5 square feet per bird.

Ventilation

Ventilation is as important as the number of birds in a house. A laying pullet or hen lives at a high speed and needs large quantities of fresh air if health is to be maintained. Fowls do not perspire, but dispose of a very large amount of moisture through their breath. It has been estimated that a flock of 100 birds gives off two to three gallons of moisture in this way every 24 hours in addition to moisture in the normal waste products of the body. If this moisture in the air is not removed the litter on the floor quickly becomes damp, and constitutes an ideal breeding place for disease germs. Good ventilation is essential, therefore, to ensure an ample supply of fresh air and to remove harmful moisture from the atmosphere of the house.

Winter Housing

It has been demonstrated many times that pullets, and particularly those of the light breeds, will give better winter production when they are housed intensively during the winter months in dry, open-fronted and properly ventilated houses. The design of the house should be such that bad weather is prevented from beating in through the open front, and a properly-placed glass hood will often prevent this. When employing the intensive system during the winter, it is important to make sure that the birds are not overcrowded. The use of this system allows the runs to rest and freshen up, instead of being churned into mud by the birds in wet weather, and provides, at the same time, an opportunity for the cultivation of a supply of winter green food in some of the vacant runs.

The change-over to the intensive system should be made gradually. A satisfactory method is to let the pullets out half-an-hour to an hour later each day until they finally have a short run out before going to roost. They may be held at this stage until there is a definite break in the weather, when the pop-hole or door should be closed for the winter. Once this is done the birds should not be let out again until the weather has definitely improved in the spring.

Winter production is often badly upset through pullets being kept intensively for a week or so and then being allowed to run out for a day or two in sunny weather, only to be shut in again for another week or fortnight. When given this treatment pullets quickly fret and become unsettled. When this happens food consumption is lowered, and there is a consequent falling off in the number of eggs laid.

Cleanliness

In addition to being dry and airy, houses should be clean. There is no need to change the litter frequently provided it remains dry. Liberal scratch feeding of grain will encourage the birds to keep the litter turned over, and at the same time provides the birds with exercise. Fresh litter should be added occasionally; choose a dull day, as it provides a further opportunity and encouragement for the birds to scratch.

All woodwork, nests, perches, and their supports should be carefully watched for signs of red mite, and creosote, tar oil, or waste sump oil promptly used if any signs of mite are observed. Handle the birds occasionally to see if they are infested with body lice. If such is the case, two or three applications of pure nicotine sulphate to the perches just before roosting time at ten day intervals will rid the birds of these pests.

Feeding

A factory which is engaged in turning out any particular article will cease to function unless it is supplied with the necessary raw material in the correct amounts. In the same way, laying pullets need their "raw materials" if they are to produce an adequate supply of eggs. The chief essential in this respect is animal protein, and under this heading come such foods as meat, meat-meal, meat and bone meal, milk curds, skim-milk, and its various dried forms. Carbohydrate or energy-producing foods are also needed, and include such foods as maize, barley, wheat-meal, and pollard.

These foods are concentrated, and if fed by themselves to flocks might cause dietetic trouble through the inability of the birds to digest such an amount of concentrated food. Therefore, it is necessary to add bulk, and for this purpose bran is almost universally used. Experience has shown that pollard or a mixture of pollard and maize or barley-meal will need about half its own volume of bran to bring it to the right consistency. This is a good all-round foundation for most poultry rations, namely, two measures of pollard to one measure of bran. Wheat-meal or stock-meal, when moistened, tends to become very doughy, and needs more bran to give it the necessary bulk. As a guide, one measure of stock-meal needs an equal bulk of bran. Alternatively, some of the bran can be replaced by other bulky foods, such as lucerne-meal or good quality lucerne chaff.

The amount of protein to be used at any given time depends on several things, such as the season, age of birds, their production and climatic conditions. Generally speaking, pullet flocks in the autumn require about 5 per cent. protein by measure—that is, 1 measure of meat-meal to 20 measures of other meals. Since it is unnatural for birds to lay eggs in winter, special feeding methods have to be adopted. A rich supply of protein will assist, as it not only stimulates the ovaries, but also supplies the necessary raw material for the resulting eggs. Meat-meal is the protein commonly employed, and generally speaking, it is necessary to increase the amount used from 5 per cent. in the autumn to 10 per cent. by the end of May or early June, and to hold it at that level during the winter months.

Controlled Feeding

There have been many arguments for and against feeding dry mash in preference to wet mash. Actually, it is a matter for the individual flock owner to decide, as there is very little difference between well-managed flocks on both systems. Some people use a combination of the two methods, and this has much to recommend it, particularly for winter egg production. Wet mash is more palatable and more readily consumed than dry mash, which is a decided advantage in the short winter days. One feed of wet mash and one grain feed daily is not sufficient for satisfactory winter laying, and should be supplemented by dry mash available from say 9 or 10 o'clock in the morning until the grain is fed at night. The mash hoppers can then be closed till next morning.

Soaked Grain

One method of feeding which is being considered by many poultry keepers at the present time is the use of soaked grain, but to get the best results pullets should be accustomed to this method some weeks before they come into lay, and a change on to soaked grain at this time of year is not recommended.

Minerals

Rations for pullets are more likely to be deficient in calcium or lime salts than any other mineral. This deficiency may be overcome by the addition of a simple mineral mixture to the mash. There is little evidence to support the idea that poultry fed on good-quality normal rations require in addition a complicated mineral mixture. One of the most efficient methods of supplying lime to laying stock is by the inclusion of oyster shell flour in their mash. If, in addition, common salt is included, then such a mineral mixture will supply all the normal requirements of a bird apart from the minerals to be found in all good-quality grains and mashes.

It is, therefore, recommended that **2 per cent. of one** of the following mixtures be added to the laying mash, care being taken to see that the mixture is evenly distributed throughout the mash:—

No. 1 Mixture:
- 50lb. oyster shell flour.
- 50lb. common salt.

No. 2 Mixture:
- 20lb. bone flour.
- 30lb. oyster shell flour.
- 50lb. common salt.

No. 3 Mixture:
- 20lb. oyster shell flour.
- 50lb. bone flour.
- 30lb. common salt.

A word of warning concerning the use of common salt should perhaps be added. Only the quantities of salt recommended must be used, and care must be taken to prevent its use in a **lumpy condition.** An overdose of salt is poisonous to poultry, hence the necessity for particular care in using it, but used in proper proportions, namely, up to 1 per cent. of the laying mash, it is of considerable value to laying stock.

Green Food

The value of a plentiful supply of succulent green food cannot be overemphasised. It is not sufficiently realised what an important part fresh green food plays in maintaining health and vigour and in promoting satisfactory egg production. Lawn clippings from a good-quality lawn are one of the best and most easily procured green foods, particularly if the lawn receives regular attention and top-dressing. Other satisfactory green foods include silver beet, young green oats, lucerne, cape barley, rape, kale, chou mollier, and water cress. Root crops, such as carrots, swedes, and mangolds, are a useful standby when other green food supplies fail.

Up to one-third of the entire ration may consist of green food, which should be chaffed before use. Some of this may be included in any wet mash which is fed, and the remainder should be given in troughs at a regular time each day. It is a wise plan to reserve some for feeding troughs after the birds have had their evening grain.

This practice enables them to obtain the maximum benefit from the grain. Lucerne is difficult to grow in some localities, but if a patch can be established it will prove a valuable asset for many years, as, apart from being an excellent green food, any surplus may be made into hay and chaffed for winter use. This lucerne chaff or lucerne-meal may be used to offset any shortage of fresh green food by using 5 per cent. to 7 per cent. in the mash, together with 2 per cent. of a good grade cod liver oil.

Water Supply

A bird in full lay will drink between ¼ and ½ pint of water daily. Lack of water will reduce food consumption and even egg size, so that it is essential to have a reliable and adequate water system in the laying houses. A useful water layout is illustrated on pages 24, 25, and 26 of the Department's bulletin, "Utility Poultry Keeping," price 1s. All drinking vessels, whatever their types, should be kept scrupulously clean and free from slime or mould. If possible, direct sunlight should be prevented from shining on the drinking water, as sun-warmed water has a harmful effect on the birds.

Grits

Poultry need grit for two reasons:—(1) It is their main supply of egg shell forming materials, and (2) it takes the place of teeth in mammals. Without grit in their gizzards, birds are unable to grind up the grain and any fibrous material in their mash. This means that in the event of a shortage of grit the quality of the egg shells will be affected and the birds will suffer to some extent from malnutrition through their inability to digest their food properly. The best shell grit is good quality oyster shell broken up to a convenient size. Finely broken scoria and red shingle, mixed with the oyster shell, will aid in the digestion of grain, and will also keep the gizzard muscles toned up.

Moulting Hens

Most farms will now be carrying a certain number of hens which are going through their annual moult. These birds deserve just as much care and attention as the pullets. More often than not, they are going to be used as breeders in the coming spring, and every endeavour should be made to keep them in good health and physical condition. It is not possible to overfeed a laying pullet with the right class of food, but it is possible to overfeed the moulting hen. They must not be allowed to put on an excessive amount of body fat, and their condition in this respect should be watched. The ideal to aim at is not to starve the hens but to keep them always ready for their next meal.

Their food should consist mainly of grain. If mash is fed, it should not be used too freely, nor should it have a high protein content. Two per cent. linseed-meal and 4 per cent. meat-meal should be sufficient until they are on the point of laying again, when the meat-meal may be increased slightly. As with the laying pullet, green food of good quality should be fed liberally. The grain mixture used may be the same for hens and pullets, the difference being in the amounts that are given to the two ages. A mixture of equal parts of wheat, barley, and kibbled maize will be found satisfactory.

Internal Parasites

It is wise at this time to treat hens for intestinal parasites. As they are already in a moult, there is no danger of checking their egg production. Full details of this treatment are to be found in the January issue of the "Journal of Agriculture" and on page 116 of "Utility Poultry Keeping." Hens so treated will come through their moult quicker and in better condition than if they were not done. A watch should also be kept on them for body lice, which can be easily dealt with by nicotine sulphate on the perches.

The essentials for winter egg production may be briefly summed up as follows. The pullets should have been hatched at the right time of the year and reared as well as circumstances allowed. The houses should have plenty of floor space covered with deep dry litter. There should be plenty of ventilation without draught, and the houses should admit plenty of light. The food should be plentiful and of good quality. Cheap or inferior quality food is, in the long run, expensive buying. There should be an ample supply of fresh green food, shell grit, and clean water. All food troughs and mash hoppers should be kept as clean as possible. A constant watch must be kept for any signs of colds, sickness, or roup, etc., and the ailing bird removed at once. Sickness or ill health has a cause, and the alert poultry keeper will remove the cause rather than try to cure the effects.

APIARY NOTES—*Continued from Page 284*

tops cut out, and allowed to cool very slowly. The hotter the wax when run into the tins the cleaner will it set right to the bottom of each block.

In all these operations only rain water should be used, but where it is not available a little vinegar added to the water will help. Where hard lime water is used, the lime unites with the wax and saponifies it, resulting in loss of wax and poor quality.

For slow cooling the tins should be covered with bags or placed in cases and covered with a close-fitting board. Cases hold the heat better, and the blocks of wax cool and solidify more evenly. Slow cooling also prevents the blocks from cracking, and a margin is left at the sides of the tins sufficient for easy removal. The blocks are also a better shape for stacking and packing.

Clean wax cappings collected during the season need not be pressed, but may be drained free of honey, heated in a water jacketed container, and run straight into moulds through the usual strainer, but care must be taken not to include scrapings of propolis. Pieces of burr-comb and scrapings from frames should be rendered separately, if possible, otherwise this material will affect the colour and quality of the wax produced.

Pale or yellow wax is purer than coloured types, which contain a good deal of propolis and resinous matter, more or less according to the locality in which it is produced and the manner in which it is handled by the beekeeper. Approximately 30 lb. of first quality wax may be obtained from the cappings of every ton of honey extracted, according to the depth of cappings taken. Where this amount is not obtained the local Apiary Instructor should be consulted with a view to improving the methods employed and thus securing maximum of production.

There appears to be an ever-growing market in New Zealand for this product quite apart from the requirements of the honey industry. Beekeepers are therefore urged to collect every ounce available during the season and to take care to offer for sale only clean wax of the best quality.

The following New Zealand importations of this commodity are interesting:—Total British and foreign for 1936, 25,350 lb.; 1937, 17,916 lb.; 1938, 8,211 lb. The exports during those years —which represent only a fraction of the total production—were 17,196 lb.; 3,472 lb. and 4,256 lb. respectively.

Price of Beeswax

Beekeepers are advised that as from February 10 last the Price Investigation Tribunal of the Department of Industries and Commerce authorised an increase in the price of first-quality beeswax from 1s. 4½d. per lb. to 1s. 6d. per lb., f.o.r. country stations.

—T. S. WINTER, Senior Apiary Instructor, Wellington.

N.Z. Federation of Young Farmers' Clubs

Edited by S. Freeman, Dominion Organizing Secretary

Dominion Executive Committee Meeting

A MEETING of the Dominion Executive Committee of the N.Z. Federation of Young Farmers' Clubs was held in Wellington on February 20. In the absence of the Dominion President the Chairman of the Auckland Council, Mr. D. S. Ross, presided. In opening the meeting he referred to the value and importance of such gatherings, especially in maintaining contacts. He expressed disappointment at the small attendance, and regret that the Canterbury delegates were unable to be present.

Report of Organising Secretary

A comprehensive report on the movement was given by the Organising Secretary. Figures were detailed for the various District and Council areas, and revealed a total of 172 clubs still active, with an aggregate membership of approximately 4500. The report stated that at the start of the war 208 clubs were functioning, with a total active membership of approximately 6000. Three new clubs had been formed, but 16 clubs had been disbanded, and a further 23 had found it necessary to go into recess for the duration of the war. The remaining 172 clubs were carrying on under the handicap of petrol restrictions and depleted membership, but in spite of this the majority of them were still doing good work. The need for a "drive" in recruiting younger members was stressed, but, all things being considered, it was contended that the movement was still in a comparatively strong position.

The chairman said the report indicated a very healthy state of affairs. He pointed out, however, that with more and more members going into Territorial camps and also overseas, the position might later be greatly altered.

Scholarships and Bursaries

As the two sub-committees (one for each Island) set up at the annual general meeting had been unable to meet, it was decided that the members of the North Island sub-committee present, with the addition of Mr. Whyte (representing the South Island), should go into committee after the meeting to formulate some basis for the scholarships and bursaries suggested by the Minister of Agriculture.

Finance

A statement of accounts showed a credit balance of £537 8s 1d. Various accounts were passed for payment, and an allocation of £100 was voted to each of the four councils. Councils were advised that economy would possibly need to be exercised, particularly in the event of future Government grants not being available.

Land Settlement

A report was read compiled by Mr. J. D. Gregan, a member of the deputation which waited on the Minister of Lands in connection with the Land Settlement Scheme discussed at the annual general meeting by the South Canterbury District Committee. The report indicated that the deputation had been favourably received, and that consideration of the scheme had been promised. The Minister had pointed out, however, that no special privilege could be granted to any one section of the community in the settlement of Crown lands. No further communication had so far been received. The question of settling Y.F.C. members on the land was freely discussed, and it was suggested that, while little could be done at the present, the position should be carefully watched with a view to moving on behalf of Y.F.C. members when any land settlement policy was mooted. It was considered that concerted effort with other interested bodies, such as the New Zealand Farmers' Union, would be of value, and finally a small sub-committee was set up to keep in touch with developments and to bring down recommendations from time to time.

Histories of Districts

Among the remits dealt with was one from the Auckland Council recommending that all clubs should endeavour to compile short histories of their respective districts as a means of preserving such records while the necessary information is still available. The value of such records was stressed in discussion, and the remit was carried.

Y.F.C. Experimental Projects

A scheme was submitted embodying co-operation by the Y.F.C. organisation as a whole in the experimental work of the Department of Agriculture. The scheme had been outlined by the Department's Field Crop Experimentalist, and involved the carrying out of a comparatively large number of small-scale trials as an adjunct to the experimental work of the Fields Division. It was pointed out that the work is of national importance, and would provide an opportunity for younger members not yet eligible for military service to assist in solving some of the more pressing agricultural problems. The types of trials suggested were enumerated, and it was stated that, if the scheme were acceptable to the Federation, seed and manure, with

WITH NATIONAL SAVINGS

Wars are fought with money as much as with munitions and men. All that you can lend to the Nation—lend, and help bring victory closer. Full details from your Post Office.

Inserted in the interests of the Nation's War Effort by the Farm Accounting Correspondence Course Department of The Farm Accounting Association of N.Z. (Inc.). Head Office: P.O. Box 693, Dunedin.

fully detailed instructions, would be forwarded to all members interested.

It was further suggested that the work should be under the control of the District Committees in each area, each club taking up the project to be responsible for two or three trials, which would be allotted to suitable members to carry out. The Department's field officer in the district would pay one visit to each trial, and short, simple progress reports would be required from the members concerned. The matter was fully discussed and its possibilities examined, particularly in the direction of providing further interest in club work as well as from the aspect of assistance to the Department. It was agreed that the proposition was a very valuable one, and the scheme was adopted by the meeting, it being urged that every effort should be made to make the project a success.

Policy of Federation

The policy of the Federation was discussed. and was referred to by the chairman as the most important item on the agenda. He reminded members of the decisions arrived at following discussion on the same matter at the annual general meeting. He stressed the present uncertainty, and suggested that plans made now might have to be reconsidered at an early date. Clubs, he considered, should be encouraged to develop along the particular lines that suited their individual conditions, and the strong clubs should help the weak.

In discussion, members agreed that an endeavour should be made to strengthen the clubs by enrolling more members at the lower end of the age scale, from 14 years of age upwards. It was considered that the Organising Secretary was carrying out good work by travelling among District Committees and clubs in the various areas, and should, as far as possible, continue to do so.

Date of Annual Meeting

The date of the annual general meeting was left to the Chairman and Secretary to decide, a recommendation being made that the meeting be held about July 30. The chairman reminded delegates that the annual meeting would be held this year at Hamilton, and assured them of a hearty welcome.

Southern Hawke's Bay Debating Contest

By K. W. R. MITCHELL, Acting Secretary, Woodville Club.

CLUBS in the Southern Hawke's Bay district held their first debating contest during the spring months. All clubs in the territory entered teams, which, considering such handicaps as the rush of seasonal work and the shortage of petrol, speaks volumes for the enthusiasm of members. In this respect the palm must be awarded to Mangatainoka Club, whose team travelled the 40 miles of hill road to Pongaroa during a severe storm, and even had to detour many miles because of road blockages. Deservedly they won that contest in the first round, for which the subject was: "That Farming Today is More Difficult Than It Was Fifty Years Ago." The other first-round winners were Dannevirke, who beat Norsewood, and Woodville, who beat Ballance.

Woodville accounted for Mangatainoka in the second round, the subject of debate being: "That the Best Net Returns May be Obtained by Eliminating the Plough."

The Dannevirke team travelled to Woodville for the final, the subject chosen for this contest being: "That the Breeding of High-producing Strains of Stock is More Important than Disease Control." The Woodville team gained the judge's decision by a small margin of points. Dannevirke was represented by A. Carswell (leader), W. Simmons, and R. McDonald, while the Woodville team consisted of K. W. R. Mitchell (leader), A. Compton, and A. B. Curry.

The general standard of debate was good, particularly when it is considered that some clubs had had no previous experience, while the performance of the clubs in the second and final rounds drew very complimentary remarks from the adjudicators. Members generally enjoyed the contest thoroughly, and are anticipating with pleasure an opportunity to stage another.

Parents and Friends Evening

By R. S. HEISE, Secretary, Hawera Y.F.C.

MEMBERS of the Hawera Young Farmers' Club entertained parents and friends at a social in the Tokaora Hall last month, the evening being spent playing Flag 500 and dancing. A one-act play was presented by members of the Tokaora Women's Division, and vocal solos were given by Miss Myra Wren, the accompaniment being played by Miss V. Beech. At the winning card tables were Mesdames W. J. Johnston and Mr. C. F. Marsh and Mr. W. J. Johnston and Private Fearon. Mr. W. J. Johnston was in charge.

Music for dancing was supplied by members of the Y.F.C. Club, and a Monte Carlo was won by Miss D. Finlay and Mr. Judd. The winners of the singing Monte Carlo were Mr. D. Grantham and Miss G. Reynolds. Mr. Harvy White was M.C.

During the evening the chairman of the club, Mr. S. Johnstone, welcomed the visitors, and thanked all who had assisted in making the function such an enjoyable one.

Tribute was paid to the club secretary, Mr. Peter Heise, who had been untiring in his efforts to see that every detail of the evening's arrangements was complete.

Supper was served by members of the club, assisted by willing helpers.

Among those present were Mesdames G. F. Marsh, H. Tosland, S. Johnstone, C. H. Peacock, W. Johnston, K. F. Wren, G. Donald, S. Howell, S. Gunderson, and R. Wells, and Misses S. Thrush, S. V. Washer, G. Pearce, E. Johnston, A. and B. Marsh, N. M. Lavery, N. Johnson, D. and A. Finlay, K. Wren, E. McCoy, G. Reynolds, O. Scanlon, M. Wren, E. G. V. and E. Beech, A. and L. Bennett, J. Geary, E. Peacock, H. Tippett, Wills, T. White, and others.

Among the Clubs: Reports on Activities

AT this time of the year there is normally a shortage of news from the clubs, many of them having gone into recess because of seasonal farm activities. This applies particularly to the South Island, where harvesting and other operations make it necessary for clubs to close down during the summer months; the same applies to a lesser degree to clubs in the North Island, many of which close down for one to two months for haymaking, shearing, etc. At the present time, in addition to the foregoing, a number of clubs have found it necessary to go into temporary recess through so many members being absent in Territorial camps, which, combined with the number of members already serving in the overseas forces, has in many cases seriously depleted active membership. —Editor.

Western Southland.

Orepuki.—Date of annual meeting decided upon. New member enrolled. Address by Mr. Cottier on "Pure Seeds." The speaker also gave a resume of the work at Lincoln College.

South Otago.

Warepa.—Annual meeting and election of officers.

South Canterbury.

Fairlie.—Appreciation recorded of service rendered to the club by Mr. W. B. McConnell, who had resigned from the office of hon. secretary. Preliminary arrangements made for sheep judging competition at the Mackenzie Highland Show. Date of annual meeting fixed. Address by Mr. W. Scott, advisory president, on "The Importance of Grass in Farming." The speaker stressed the necessity for adequate topdressing, and answered a number of questions.

Geraldine.—Arrangements for stock judging day. General talk by Canon Norris.

Wairarapa.

Alfredton.—Annual meeting. Officers elected: Patron, Mr. A. A. Napier; advisory members, Messrs. J. L. Heckler, J. McKay, and M. Hull; chairman, C. Algie; secretary, A. Algie. At the previous meeting it was decided to send fleeces to be judged at the Masterton A. and P. Show, the profits to go to the District Committee funds.

Horowhenua.

Levin.—Stock drive to be held in aid of local Queen Carnival. Talk by Mr. J. S. Moir on "Farm Accountancy."

Manawatu.

Bunnythorpe. — Final arrangements for tug-o'-war competition. Address by Mr. J. Hill-Motion. M.R.C.V.S., on "Diseases in Dairy Cows."

Feilding.—Teams for club debate selected. Address by Mr. C. J. Hamblyn, Department of Agriculture, on "The Growing and Harvesting of Small Seeds for Local Use." The following officers were elected at the annual meeting:—Advisory president, Mr. H. Brewster; chairman, I. D. Colquhoun; secretary and treasurer, T. M. Henson.

Oroua Downs.—Date of annual meeting decided. Arrangements for club picnic. Address by Mr. C. J. Hamblyn, Department of Agriculture, on "Grass."

Waituna.—Annual meeting. Officers elected:—Advisory president, Mr. N. V. Shannon; chairman, A. H. Sowerby; secretary and treasurer, S. H. Thomasen. Three new members welcomed. Arrangements made for club field day.

Whakarongo.—Date of annual meeting fixed. Letters read from members on active service. Lantern lecture by Mr. J. Hill-Motion, M.R.C.V.S., on "Mastitis and Sterility." A large number of local farmers were present by invitation. A field day was held on Mr. R. G. Scott's farm, demonstrations including the following:—Dairy cows, Mr. T. Ranford; dairy bulls, Mr. T. Ranford; lucerne, Mr. R. G. Scott; pastures, Mr. L. Earl, Department of Agriculture.

Wanganui.

Bulls.—Movie films exhibited by Mr. K. W. Dalrymple, illustrating his travels through Alaska; head of moose, fox, and other animals were also shown to the members. At the previous meeting a lecture was given by Mr. D. S. Hart, of Feilding Agricultural College, on "Bone Structure of Animals and the Controlling of Bone-growth by Feeding."

Mid-Taranaki.

Cardiff.—Dance to be held for patriotic purposes. Address by Mr. G. A. Blake, Department of Agriculture, on "Liquid Fertiliser."

Pukengahu.—Arrangements finalised for club concert and dance for patriotic purposes. Discussion re sending of parcels to club members on active service; subscription list opened to club members to raise money for the parcels.

North Taranaki.

Hillsborough-Tarurutangi.—Date of annual meeting fixed. Talk by Mr. R. P. Andersen on "Farms and Farming in Canterbury."

Inglewood.—Business meeting. The sum of £1 each was voted to three club members home on leave from N.Z.E.F.

Mangorei.—Annual meeting and election of officers. Impromptu speeches by members on (a) pig husbandry; (b) whether profitable to feed concentrates to pigs; (c) which is the cheaper, to buy wooden posts or to make concrete ones? At the previous meeting Mr. H. Buttimore, of the St. John Ambulance Medical Corps, gave a talk and demonstration on "First Aid."

Northern Hawke's Bay.

Wairoa.—Attendance of 50 members and visitors. Club decided to participate in the Y.F.C. experimental scheme. Letters read from members overseas on active service, R. J. Powdrell, P. A. Jessep, and R. E. Goodley. Lantern lecture by Mr. Bernard Teague, the second of his series, "Seeing New Zealand with a Camera."

Te Kuiti.

Otorohanga.—Date fixed for annual meeting. Arrangements for annual ball. Two new members enrolled. Lantern lecture by Mr. K. M. Montgomery, Department of Agriculture, on "Land Cultivation" and "White Clover Strains." Recent club activities included a social evening, with dancing, etc., more than 100 being present (the music was provided by the club's orchestra), and a picnic, which took the form of a sports meeting, the total attendance being 56. Winners of events were as follows:—O. Rowntree (high jump), J. Mark (440 yards and 100 yards). A shearing competition was also staged, the winner being G. Evans. A club debate was also held at a recent meeting, the subject being "That Country Life is Better than City Life." Teams were as follows:—L. Huer, T. Shields, D. Hemara, and S. Long (affirmative); S. Smith, R. Pevrill, R. Chilcott, and H. Rothere (negative). The judge, Mr. Webber, awarded the decision to the negative team, and gave an interesting talk on debating.

Waikato.

Tahuna.—Annual meeting and election of officers. Discussion on previous year's work and ways of expanding the club's activities. Arrangements were made for an annual ball.

Auckland.

Franklin.—Entries for baconer competition received, as follows:—C. Upton, L. G. Shaw, W. I. Downes, D. Hoult, J. Appleby, C. Appleby, W. Pussel, R. Cossey, R. W. Franke, A. Franke, A. Dreadow, C. Wolfgram, A. Cochrane, and H. Kirton. An interesting lecture was given on "Pig-housing, and the Care and Construction of Cowsheds, etc."

Harrisville.—Arrangements for future activities. Impromptu speeches by G. Barrett, E. Smith, D. Barnaby, A. Martick, P. Palmer, K. Barnaby, A. H. Wilcox, E. D. Williams, and W. A. Barnaby.

Hunua.—Lecture by Mr. Alex Longwell on "Pig Judging and Accommodation."

Western Bay of Plenty.

Kati Kati.—Impromptu speeches given by all members present; the talks were of a very high standard.

Paengaroa.—Decided to forgo annual sports meeting and hold a dance instead. Movie films were shown by Mr. Lay of "A Tour of the South Island and of North Auckland." Mr. Dunlop also exhibited a film taken in the main street of Te Puke. At the previous meeting a visitor from Nelson gave an account of his travels through Canada and California.

Pukehina.—Lantern lecture by Mr. A. V. Allo, Department of Agriculture, on "The Development of Pumice Lands."

Te Puke.—Report of dance. Lantern lecture by Mr. A. V. Allo, Department of Agriculture, on "The Development of Pumice Lands." A field day was held on the property of Messrs. D. and S. Ross, Te Puke. Mr. D. Ross, the club's advisory president (and also chairman of the Auckland Y.F.C. Council), conducted members over the extensive piggeries during the morning. In the afternoon Mr. A. V. Allo showed members over the pasture trials and demonstrated different pasture strains, etc.

Health Notes for the Farm

Contributed by the Department of Health

The Pre-school Child

Our Duty Is To Protect Its Health

"It is a generally accepted fact that the development of any living organism is influenced to a very great extent by the conditions to which it is subject in the early stages of its growth. This fact is of supreme significance when related to the unfolding of a human personality, for in this case it is not merely the fate of a physical body that is at stake, but of a complex being compounded of body, mind and spirit—a trinity, each element of which reacts and is dependent upon the other. Failure to perceive and fully appreciate the implication of this is largely responsible for widespread neglect of the fundamental needs of young children, the repercussions of which are manifest in every phase of a nation's life."

—P. E CUSDEN: "The English Nursery School"

THERE is wisdom in the above quotation, for the health, happiness, and efficiency of men and women depend to a large extent upon care and training during early childhood, when life habits are formed which are responsible for health, character, and personality.

As so much depends upon our knowledge of the fundamental requirements of early childhood, it is most necessary that attention be drawn to that interesting and important figure, the pre-school child—that is, the toddler between the age of two and five years. Although the more urgent claims of the baby of the family distract attention from him, we know that the toddler has a mental life as delicate and complex as his physical body, and that his future largely depends upon the provision of proper care and training during this early critical period of his existence.

Parents' Responsibility

A young child lives a life full of hopes, ambitions, doubts, misgivings, joys, sorrows and strivings that are being gratified or thwarted in much the same way at three years of age as they will be at thirty. He has certain characteristics that make the acquiring of new habits easy; he is open to suggestion; he accepts as correct information from a person he looks up to; he wants to please those he loves; and he strives to adjust himself to the numerous and varied changes incidental to the early years of life.

The responsibility of parents is therefore great, and it is to assist them that various agencies have been established, for example, ante-natal clinics, the Plunket Society, pre-school clinics, the School Medical Service, and so forth. By care before birth and during infancy the foundation of a healthy life is laid. Not only are we concerned with the production of a perfect child, however, but we are also concerned with the responsibility of providing him with a wholesome environment in those early years which make up the critical period of growth and development.

Heredity and environment together are responsible for the development of every living thing. The practical question is, therefore, what may be done to control both, so as to secure the best results for the child. The parents' mental ability, control of their emotions, their interests, particularly their interest in the child, their ambitions or lack of them, and so forth, all in some degree determine what the child shall make out of the endowment that Nature has given him.

How essential it is, therefore, to provide the child with conditions favourable for satisfactory development of body and mind. In this connection, trust should be placed in such essentials as ample sunlight and fresh air, warmth and shelter, nutritious food, balanced exercise and healthy habits. The physiological needs of the child should not be forgotten, and provision should also be made for skilled medical supervision for the detection and treatment of physical defects.

Early correction of defects insures health.

Forming of Habits

Living right, and thus living long, is a matter of habit. It is during childhood that most habits are formed, so that it is important that children should be guided into good habits. When it is realised that habits are extremely hard to break, the importance of forming right habits early in life is obvious. It may be taken for granted that the child trained in the ways it should go will not usually depart from them in later life. Habits which should be impressed early in the young and growing mind are those of neatness, orderliness, and personal cleanliness.

In addition, special care must be devoted to the removal in the child of weakness or defect by attention in its earliest stage. The Department of Health is striving to reduce diseases not only by sanitation, by a clean safe milk supply and by the removal of conditions which facilitate the breeding of disease, but also by the instruction of mothers in the primary essentials of hygienic living. One great purpose of the New Zealand ante-natal clinics, the infant welfare centres, and school medical service is to increase popular knowledge along these lines. Parents should avail themselves of these opportunities on behalf of the children.

It is well known that good mothers do not necessarily come into the world ready-made, and that the instinct of motherhood is not of itself a sufficient equipment for the satisfactory nurture and upbringing of a family. Even the amazing power of self-sacrifice for which mothers are proverbial cannot act as a substitute for knowledge and training in the essentials of mothercraft. The modern kindergarten does much and valuable work in the interest of the pre-school child. In the environment thus provided he has a life of joyous activity, where healthy interest is quickened and energy wisely directed, and where his body is subjected to a wholesome regime of work and rest and play.

Infectious Diseases

A harmful doctrine held by some parents is that all children must have the common infectious diseases, and that they may as well be exposed to infection in order to have them while young. This idea is quite erroneous, as any illness, however brief and slight, is a hindrance to growth, and may mean permanent impairment to some organ or function of the body.

Statistics prove that there is an urgent need for guarding the pre-school child against infectious diseases. A large percentage of illnesses from these diseases occur under five years of age, and many of these, such as diphtheria, whooping cough, and measles, are the causes of chronic illnesses of adult life. Where it is possible to take measures to protect children against infectious disease, parents are strongly advised to do so. It is a well established fact, for instance, that ordinary vaccination protects against small pox, and that by a simple process of immunisation children may be safeguarded against the dreaded diphtheria.

It is obvious that treatment and care during early life is our first line of defence against disease and suffering. There are more than 100,000 pre-school children in New Zealand, and proven

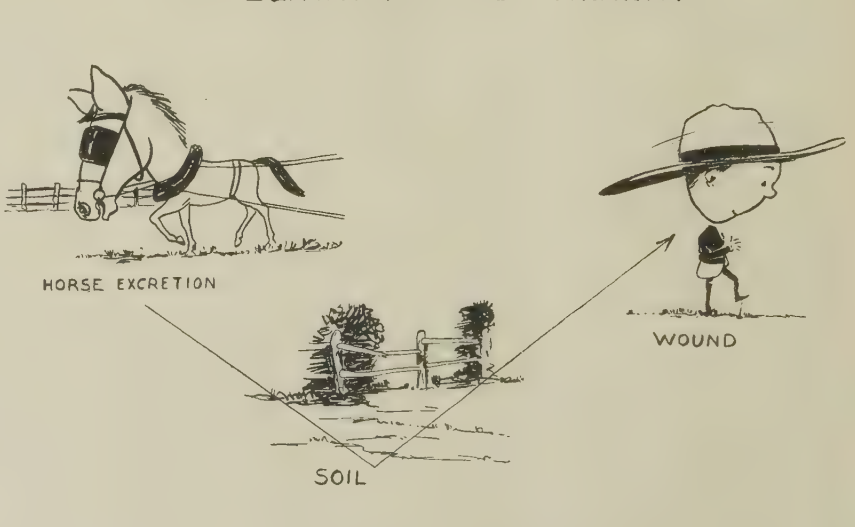
Immunisation protects the little child against diphtheria.

methods for their protection—for instance, against diptheria—should not be neglected. Arrangements have now been made to afford this protection at several of the Plunket rooms. In any case, the Medical Officers of Health and School Medical Officers throughout the Dominion would be glad to arrange for the immunisation of pre-school children against diphtheria.

A Trust And Duty

The pre-school child is one of New Zealand's greatest assets. The protection of the health of this important section of the community is a sacred trust and duty. Parents, therefore, should avail themselves of the opportunities afforded by the Department of Health and other agencies for this purpose. Many young lives will be saved and much illness avoided by such essential co-operation.

This diagram clearly illustrates the method of the transmission of lockjaw, which was discussed in last month's issue.



THE Good Neighbour

BY MARY

From Me To You

HOW often do you reach the stage when everything seems to go against you? The other day everything in my life seemed to be going wrong—plans I had made had to be unmade, nothing I did went right, and somehow I was feeling that nothing in life was really worth while. Yet that same night, and quite unexpectedly, I came across these words of Charles Dickens:—

"Reflect upon your present blessings—of which every man has many; not upon your past misfortunes, of which all men have some."

Here, it seemed, was a direct challenge to my mood of utter discontent. So, there and then, I counted my blessings, one after the other—and it took me quite a considerable time, too. And I found, long before I had finished counting, that the little things which had irritated me that day seemed of no importance, and had no true value when they were measured up against these many blessings which I had, and which were still in my possession.

Before I slept, I gazed awhile out of my window, gazed on the silent garden, sleeping in the moonlight. Every flower seemed petalled with silver, the leaves of the trees traced a filigree pattern against the sky, and the peace of the night enfolded me, shutting out the troubles of the day. After all, what a grand world it is! There's always something to be glad about, if only you will take the trouble to find it.

So, I would say to you, count your blessings when things go wrong. Remember, too, the old saying which cautions you not to cross your bridges until you come to them, and I think you will find, as I have found, that Life is a wonderful adventure, despite the small setbacks which from day to day seem so gigantic, but which in reality are as nothing when compared with the richness of our many blessings.

Mary

Mary's "At Home"

HERE is an appreciative reader to shake hands with you and accept your invitation to a chat. I agree, heartily, on the value of time. It can yield such a rich harvest, used wisely. It doesn't have to be an enemy, as so many folk think. Why, even to learn to let it slip gently through one's fingers occasionally is a good thing. Wasn't it the poet Davies who said, "What is this life if full of care we have no time to stand and stare?" One gathers so much from the "staring"—quiet, and beauty, and strength, and courage for the busy moments. You were talking of painting. Nowadays it isn't confined to men's skill, is it? More than one of my girl friends have found the fun of freshening their furniture themselves. I shall came to painting my bedroom furniture soon, I hope, with a bit of tidying up first. William Morris's resolution is a good one to adopt—"Not to have anything about me except that which I believe to be beautiful, or know to be useful." A searching test, but well worth while.—"YOUNG TYKE" (Wellington).

I DO all my own work—washing, gardening, and vegetable growing. It's a grand life, full to the brim, and running over. Your article "From Me to You" was delightful. So often I feel I would slow down time. Each golden day goes so quickly, never to return. Don't hurry, hours of gladness—I love you so. As the advertisements on the hoardings used to scream at us "Death is so permanent." It's everyone's job to be happy. I love housework, and planning meals. It is interesting, and quite a science—anyway, it is all a question of looking ahead, and planning.—TOKI (Gisborne).

MY twelve-year-old daughter has just finished reading "The Pilgrim's Progress" and asked me who wrote it. "John Bunyan," I told her, but was quite at a loss to understand the chuckles of mirth that followed. When at last she subsided enough to explain, she said "Bunions—aren't they corns?" "Why, yes, but what has that got to do with it?" "Oh," came the reply, "John Bunyan mightn't have had bunions, but I guess the poor pilprims had plenty!"—BILLIE (Blenheim).

I WAS very interested in your letter in the February "Journal." How very true it all is! There is nothing more tragical than to hear when it is too late "If only I had done ——." Nothing makes me more hot under the collar, as the boys say, than to see someone frittering their time away, which I would give almost anything to have for something most important. Well, nearly all my bottles are filled with fruit, jam, jellies, and pickles, and I am not sorry. It's a hot job. If only we didn't eat, we would have nothing to do, but the boys say they'd have nothing to look forward to!—MARY ANN (Bell Block).

THANKS so much for your friendly letter. Yes, I've read "Testament of Youth," but some time ago, and I must read it again one of these days. However, I shall have to like it a lot to prefer it to "Testament of Friendship." Something about Winifred Holtby makes a very real appeal to me, and also I am one of the few who believe that two women can be great friends.

Recently I received a calendar from a friend in England—each month has a poem by Patience Strong, who has the "Quiet Corner" in the "Daily Mirror." This one I think you will like—it is called "Our Mission."

To do the kind and friendly deed,
To see the want, and to meet the need,
To seize the chances that come along,
To ease the strain, and to right the wrong.

To bring a smile to the frowning face,
To flash a light in the gloomy place,
To spread the gospel of happiness
Where hearts are heavy, and cares depress.

To help each other along the road,
To lend a hand, and to share the load,
To take the best, and the brightest view—
That's what we're put on this earth to do.

—"*CROSSROADS*" (*Apiti*).

MAY I leave the inverted commas off your name? It makes you more a person and less a name if I do. It also raises an interesting question—that of intimacy, and the use of Christian names. I, personally, think that to use a person's first name after short acquaintance, instead of letting it be the flower of friendship, is a real loss. For one thing, it leaves nothing for further growth. Where, by permission or implied willingness, it is a gift, and not a casual thing of no significance, it is the proof of deepening and lasting friendship.

But I must get down from my hobby horse, and come to another sort of name—one under which to send you contributions from time to time. The one I'd like to use is "London Lass." A pen-name of course is the English version of nom-de-plume, which no doubt links on to the quill pen that preceded our separate nib and penholders. It also accounts for the "penknife" (to sharpen the quill), now called "pocket knife." I once saw a quill pen, long ago.

—"*LONDON LASS*" (*Wellington*).

I WAS very pleased to see your page in the "Journal of Agriculture." It is sent to us, as this branch of the country library is housed on our shelves, and it was a nice surprise to open the January number and see the new arrangement. I have very strong views on your subject for this month. There is no such thing as boredom in the life of a woman who in its truest sense "keeps up appearances." Some day I would like to tell you of a visit I paid to a friend who is an adept at it. Most of us could sit at her feet with advantage. I am enclosing my opinions, and please may I have a nom-de-plume? It is easier to air one's views, somehow.

"*EMILY*" (*Waikato*).

YOUR pages in the "Journal" are much appreciated, not only by the womenfolk, but also by their husbands; at least I have seen mine going through your pages and commenting on the recipes, with suggestions that I should try this one or that. So, seeing your request for stale bread recipes, I asked his opinion on my best way with it—after all, if the men or the children don't appreciate the way you use it up, it's not much use doing that again, is it? Well Hubby didn't hesitate; he said "Refreshed Bread, of course." so I have sent on the recipe. It is not hard to digest like real fresh bread, and it has a lovely crunchy crust. My family would like me to bake my bread long enough ahead, that it would always need "refreshing," as they call it.

—*MRS. D. MARRA* (*Buckland*).

Lovely Lighting Makes Lovely Rooms

THE beauty of daytime lighting depends largely on how your architect has designed your home, and how you have placed your treasures therein. A ray of light caught skilfully will often brighten a dingy corner. Try polished brass in a dull corner; and do not overlook the value of mirrors.

But although you may feel you could often pick a quarrel with your architect in the way he has placed your windows so that they do not reflect the light of day to the greatest advantage, it is up to you to use your nightlight to greater advantage. Light at night has two uses—practical and decorative. But there is no reason why you should not combine the two uses to good effect. Place your standard lamp near your favourite armchair, or beside your writing bureau. If your family is not too large, you could perhaps dispense altogether with the central lighting, and have just a few reading lamps placed to suit the users.

Maybe you have a lamp with a pretty shade, which is only decorative. Well, be careful to place it where its light will catch some treasured possession—perhaps your polished brass, or shining silver.

Light can make or mar the beauty of a home. Modern lighting leaves little to be desired, but even if you are not fortunate enough to have the modern wall-type of lighting in your home, make use of two-way switches and extra flex, and you will find your rooms taking on a new lease of life to greet the coming winter evenings.

DELAYS *are* DANGEROUS
EFFECT That POLICY
with the
GOVERNMENT LIFE
TO-DAY

BRIGHTNESS FOR WET DAYS

NOT many years ago, when we woke up in the morning and found it was wet we would rummage in our wardrobes and pull out our shabbiest coat, brush up our oldest shoes, and give a quick look at our hats, finally selecting the most shapeless of last winter's well-worn felts. Then, attired in our glory we would sally forth to face the elements. No doubt it gave us great satisfaction to think we were having yet another wear out of our last year's cast-offs, but what freaks we all looked!

It is always good to know, if only in passing, charming human beings. It refreshes one, like flowers, and woods, and clear brooks.

—George Eliot.

Those days are done. They are laid away forever, like our dolls of childhood years. City streets now on wet days are just a mass of bobbing colours—hats, raincoats, umbrellas, all vieing one with the other to be the gayest. And what a difference it makes to our optimism, especially in these days of worrying and troubles.

Raincoats this year are the brightest ever made. Perhaps the manufacturers had an eye to the magic of colour when they were designing this year's crop of raincoats? For they are in the shops in all colours and patterns imaginable—the tartans I told you of last month are very much in evidence. Checks, too, are still popular, and we must not overlook the rain-cape which has had such success in the last few years. A rubber rain-cape has the advantage of rolling up into a very small space when the weather looks doubtful, but is there ready for use when the clouds break. Rain-hats in the popular oil-silks, and in all shapes and colours, have also the advantage of being slipped into your pocket when the rain is done.

This year we are going to look brighter than ever before when the weather is wet. And if you add a gay raincoat to your winter wardrobe you, too, will feel a glow of satisfaction when you have to go out in the rain, knowing that you look every bit as fresh and charming as you looked in the days of bright summer.

Rochelle Hudson, Columbia star, wears this bright wet-weather outfit. Her raincoat is in plaid, and features vivid reds and greens. Her rain shoes are bottle green, as is her pull-on felt.

Diamond-shaped smocking highlights this "Black Tea" crepe frock worn by Mary Carlisle, Columbia leading lady. The smocking releases slight fullness over the bosom, and to the shoulder line. The nipped-in waist and slim skirt line are other interesting notes.

While the Log Burns . . .

"The City of Beautiful Nonsense."

By E. Temple Thurston.

THE name of this book is as delightful as its story—"The City of Beautiful Nonsense," by E. Temple Thurston. From beginning to finish it is as good as a dose of exhilarating tonic—it is no more than light fiction, but if you feel tired of the world, and want a joyful change in the realms of romance, I would recommend it to you. It almost follows the conventional lines of the old fairy stories we knew and loved when we were young, starting "Once upon a time," and finishing "They lived happily ever after." But in between we follow the hero, John, who is the proverbial penniless author, through an amazing story of romance and pretence, until at last he wins his lady love—in this case, Jill.

"The City of Beautiful Nonsense" is the city of every lover's dreams—Venice. And it is Venice by night that most people regard as "The" Venice, a city of waterways, with silent gondolas gliding by in the stillness and shadows of the night. But here we find another Venice.

"Come to Venice in the early morning, and you will see a city bathed in a sea of light; for it is not only that the sun shines upon it, but that, like the white shoulders of a mermaid, glittering with the water drops as she rises out of the sea, this wonderful city is not illuminated only, but is drenched in light itself. It is no city of shadows and mysteries then. There are no dark waterways, no deepening gloom beneath the bridges. In the early morning it lies, as yet unawakened, blinking, flashing, burning—a rose opal, set clear against the sun."

John is a dear. You will laugh with him, and at him, but you will love him just the same. His struggles to keep up appearances before his loved lady are the means of leading him into many a fix; and further on, his efforts to keep up the story of pretence and romance which he has woven for the delight of his old parents will prove indeed the truth of the old saying, "Tell one lie, and then make up another dozen to cover it."

There are little passages of loveliness all through the book, little pieces you will wish to underline if you own the book.

Oh, I loved it all, and I am sure you will love it too. You will close the book feeling as though you have turned the key on the land of faery and romance, but you have brought away with you all the magic and beauty you found therein.

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Our Competition

Do New Zealand Women Keep Up Appearances At Considerable Cost To Themselves?

THE entries for this competition were exceedingly interesting, and although almost as many of you answered "No" to the question as answered "Yes," yet I think almost everyone is agreed that while the average New Zealand woman may keep up appearances at cost to herself, it is better to wear out than to rust out.

Do not be disappointed if you are not among the winners this time—the entries were all so good that it was very difficult to separate some of them.

First prize of 10/- goes to "Silverbirch," Otago; second prize of 5/- to Mrs. G. H. Carlow, Timaru; and highly commended: Mrs. B. A. McKenzie, Waimahi, and "Crossroads," Apiti.

Here they are:—

First Prize

METHINKS "Mary" has to a large extent answered this question in her "From Me to You" in the February "Journal," when she says, "It is the busiest people who are the happiest, and the happiest people are the ones who accomplish many things."

Look around you, and the truth of these statements is amply demonstrated. When there is anything extra to be done for a charitable or patriotic object, or for any purpose for the general good, is it not to the busy woman that we look for help? The woman who runs her home well, and who attends to the care and well-being of her family, is the very one who can undertake a fresh duty if the need arises. It may require a little planning, perhaps even rising a little earlier, but it will be done, and well done. As to shortening their lives in the process, this may happen, but in my experience—which has been considerable—I have always found that the busy woman, as well as being the happiest, is also the healthiest. Whether this is an instance of psychological effect I know not, but I do know that the women who have the least to do seem to have the most complaints, and really seem to talk themselves into illness. There are cases, particularly among farm women, when the mother badly needs efficient help to enable her to attend to her many duties, and yet have some time for rest and relaxation, but I do not think that even in these cases are there many instances when life has actually been shortened by overwork.

The ones who suffer most, and whose families suffer with them, are the "social climbers," who must always "go one better" than their neighbour in the way of entertaining, whose house must be in perfect order, and yet who must not miss a single function no matter how inconvenient, who literally live on their nerves, and keep themselves and their households on the verge of a flare-up. Better the jolly soul who, if she has to attend a meeting, will whisk through her duties, overlook a bit of dust for once, arrive at her meeting in a good temper, and returning, after an enjoyable time, still in good humour and appreciative of the welcome she will receive from her family. Worry, not work, will injure minds and eventually bodies. Banish worry, financial or otherwise, from our homes, and I do not think that work will injure any one, either man or woman.

—*"SILVERBIRCH" (Otago).*

Second Prize

THERE is a saying, "It is better to wear out than to rust out," and I should think the women of New Zealand have taken it as their motto. As I came from England only 15 months ago to marry a farmer, I do not know much of the business women of the towns, but those of the country have my unbounded admiration. Their tireless energy (or is it will-power?), to say nothing of their cleverness and resource in "making do," make me wonder if I can ever reach such a standard, however much I try. I realise that most of them have come from a very different stock; that their mothers and grandmothers have perhaps handed down, with all their accomplishments, that stamina they seem to possess, whereas I was brought up in a manufacturing town, and worked in an office for 35 years.

I have thought a lot about this keeping up of appearances, and tried to analyse it. It doesn't seem related to swank, but is rather a determination to keep up the traditional pioneer spirit and "do their darndest," as well as a desire to be real partners to their husbands, most of whom do not spare themselves in their work and social duties. All this is not done without cost, but is not so costly to a woman as having not enough to do, or to be interested in. Although I have never worked so hard physically in my life, my health is much better, and I have gained a stone and a half. So here's good luck and good health to the women of New Zealand, and may the next generation be a credit to them!

—*MRS. G. H. CARLOW (Timaru).*

Highly Commended

I WOULD say "Yes" to your question, but the life of a New Zealand woman has become such a tradition, in that our pioneer mothers began it with such heroic courage and ability, that it behoves us of later days to carry on the torch. It is a wonderfully healthy life to be busy, even if it means cooking, sewing, and housework with one pair of hands, as well as keeping in touch with our fellowmen, for our mental well-being is just as important as our physical health.

Healthy activity is good for one and all, and I would say that the average

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busy New Zealand woman is far healthier both in body and mind than one who has too much time to think of herself. This latter one is the one who shortens her life to any extent, for although the former becomes weary at times, and it is a distinct effort to carry on, she has a sense of achievement, of something attempted and done, to make this world a better place for others. I would have a reasonable amount of work for all, counterbalanced by reasonable relaxation in whichever form the individual preferred.

Keeping up appearances could be a terrible strain on the New Zealand woman, but I think the one who does what she can reasonably manage achieves the most. We should cultivate a non-worrying aspect towards the little things that do not matter—if the polishing does not get done today, there is still tomorrow. We should take our opportunities as they come. I would rather be a New Zealand woman of reasonable activity than one who sits and twiddles her thumbs.

—*MRS. B. A. McKENZIE (Waimiha).*

WHO WILL WIN?

"WHO called Youth Golden?" asked Winifred Holtby, the English authoress. Yet we all talk about the days of our youth as the most gladsome years of all—is it because the years have given our memories haloes of soft colours, smudging out the unhappy memories, leaving only the golden ones? I would not call youth the "Golden Age"—when one has reached maturer years one grows to realise that. But you may not agree with me.

"What do YOU consider the best years of your life?" Your ideas will all be different—send them to me.

Two prizes will be awarded: First 10/-, and second 5/-. Send me your opinions before May 15, 1941, let me know what YOU think the "Golden Age."

"Mary"

● CLOSING DATE: 15th May, 1941.

C/o. "Journal of Agriculture," P.O. Box 3004, Wellington.

WITHOUT doubt, New Zealand women do keep up appearances at cost to themselves, but how can they avoid paying that cost when help for the average home is almost unprocurable? Visit any hospital, and there you will find many women patients who, if they could have rested more and had less work to do, would not be hospital inmates. All work and no play makes Jill a dull person, and many a weary woman would be happier resting, yet she feels it a duty to be interested in affairs outside her home, so away she goes, thinking either that she is helping some good cause or that a change of environment will do her good. Perhaps it does, but so often these so-called recreations bring extra duties that are just another strain for the woman who already has a full-time job caring for her family, her home, doing a bit of farm work, as well as being interested enough in her own appearance to want a little time to try and keep that schoolgirl complexion we read so much about.

Perhaps she is foolish to work so hard to keep up appearances, but it is part of our British tradition to put the best face to London, and although she is often advised not to do this and not to do that, the average woman will quite agree with the writer who wrote, "An emperor in his nightcap will not meet with half the respect of an emperor with a crown."

If we must keep stepping with very little spare time, let's do our best to keep smiling, and hope that the busy people are the happy ones as we decide it is better to wear out than to rust out.

—*"CROSSROADS" (Apiti).*

Facing the future on the farm is what our girls are doing. But the Metro-Goldwyn-Mayer star of our picture is Joan Crawford, whose hobby is her horse.

OF course they do. The desire to keep up appearances is a precious heritage which we must always cherish and pass on, and the capable, competent woman disciplines herself so she can cope with the affairs of her household without undermining her health, but the less competent one pays a heavy price for a good thing. Early rising is often the secret of success. In this way the housework can be disposed of before it becomes hopeless, for a late breakfast and a flick of the mats after midday affects the health of body and mind more than 5.30 a.m. rising ever did.

However, for many women, there is an unfair pressure of work, and they, good souls, submerge their own desires to make and bake and clean for those they care for. Consequently, they find it difficult to go out to functions, to entertain, and to be happy, yet they prefer to keep up appearances, no matter what it costs. But it is in each woman to rise above her troubles, and

ANZAC POPPIES

Fall, scarlet petals, to the bosom of the still grey earth:
Fall and be rent. There in resignation sing
A requiem; a song of questionable mirth
For the things we are remembering.

Fall, crystal tears, to the rhythm of that requiem,
Fall and be spent; so let aspiration bring
New gems of hope, to grace war's diadem,
For the things we are remembering.

Fall, scarlet petals, to educate and elevate;
Fall and bleed again; thus by your bleeding bring
A birth of better ways, a vision winged and great
For the things we are remembering.

Rise, men of hope, in your illumined might.
Rise and repent, let all devoutly sing,
"Morn yet shall light this earth's dark night
From the things we are remembering!"

—*Berta Sinclair Burns.*

in the struggle she emerges a better self, so it is well for us, a young nation, to exert our will-power and control this problem, not permitting it to overwhelm us.

—*MRS. A. C. TOWNSHEND (Oxford).*

IT depends mostly upon the planning power of the individual woman. I was fortunate enough to work under a woman who taught me many a valuable lesson. Her slogan was "Utilise your **moments,**" and I learned the art of dovetailing jobs, so that large clear spaces were available for the things not generally regarded as essentials, but without any neglect of the necessary spadework. The cost of keeping up appearances in its best sense results in the profit of having bought a really first-class article. An attractive home, and well-cooked, well-served meals in the face of the domestic difficulties many of us have to contend with, shares the spark of genius with any other notable achievement. Mercifully, lack of money seems to have little to do with it. I know women who run their homes with a graceful flourish on the smell of an oily rag, and thrive on it, while others with five times the income degenerate into drab, complaining drudges. It can either be very expensive, this keeping up of appearances, or astonishingly cheap—as you wish.

—*"EMILY" (Waikato).*

BIRCH IN AUTUMN.

A birch tree, that so fragile is in spring,
When autumn comes is still a graceful thing—
Her slenderness, once green, has turned to gold,
And all the brown and russet shades untold;
See now, in her new poise, the pride of days
Born of the golden hours of summer haze,
'Til mellowing suns transformed her tender grace,
And left their shining glory in her face...
O! though I love a birch tree in the spring,
My autumn birch is such a beauteous thing!

AS I have only been in New Zealand 2½ years, I can only answer "Mary's" question from what I have observed in that time. I do not know what statistics have to say, but one or two things have struck me very forcibly in that time.

Firstly, the number of women who have at one time or another spent long periods in hospital—this seems far more general than in England; and secondly, the large infant mortality that one sees in the columns of the daily Press. Now, these two observations seem to point to the fact that New Zealand women do overtax their strength, and suffer in consequence. In the country, too, I have often been amazed to learn the age of a friend. Several times I should have put it down as five to ten years older than they are really.

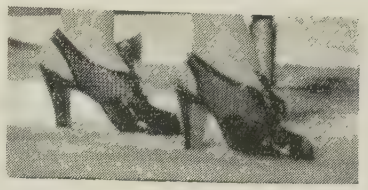
Unfortunately, I cannot see any solution to this problem, unless it is that social engagements are cut down. There is no doubt that many are putting their last ounce into the war effort, but even this should not come before personal health, as if that breaks down they will only give more work to others.

—*"PLAIN JANE" (Taupiri).*

Wherever snow falls, or water flows, or birds fly, wherever day and night meet in twilight, wherever the blue heaven is hung by clouds or sown with stars . . . there is Beauty.

—*Emerson.*

"... Only Skin Deep"



Happy Feet Help

IT may seem a far cry from your toes to your forehead, but believe me, unless your feet are happy, your forehead will reflect your discomfort with those aggravating wrinkles. So look to your feet. They are very treasured possessions, although they are apt to be overlooked in the rush of every-day life.

The first essential to foot comfort is, of course, a good-fitting shoe. Difficult to obtain these days, perhaps, but it is well worth while paying the extra money for a good shoe, and your feet will thank you again and again.

Are you one of those women who go through the day's work in ill-fitting slippers? Nothing will tire your feet more than "slopping" around in slippers. Not that I am condemning slippers in any way, but while they can be such a comfort if only put on after the evening meal, they turn into a menace if worn all the time, day in and day out. About the house use a flat-heeled shoe, or perhaps a comfy sandal.

And check up on the size of your stockings, too. A too-small stocking is often the cause of foot troubles.

Bathe your feet daily—perhaps twice daily is not too often if the weather is warm and you are standing most of the time. Soak them in warm water in which a few crystals of potassium permanganate have been dissolved, and after you have dried them thoroughly massage with liquid witch-hazel. Boracic powder dusted freely between your toes and sprinkled inside the feet of your stockings is very soothing, whether the weather is warm or not.

Bathing in salt water is very beneficial to weak ankles. If you are near the sea, then so much the better, for a daily "paddle" will work wonders.

And don't forget your toe-nails! So often we file and polish our finger-nails, but how little attention our toe-nails usually receive. Do not trim the tips in the corner of your toe-nails—they are better kept flat.

Do you suffer with corns and callouses? So many people do, and it is such worthless suffering. A warm soda bath is a help to soft corns, but perhaps a harder corn will need more drastic treatment. Try rubbing a little cuticle remover on to callouses—it is only a temporary way of removing them, but is quite effective.

The comfort of your feet means so much to your health, and your outlook on life generally. Please don't neglect them—they will be so grateful for a little trouble taken over them. And with happy feet you will soon find yourself tripping through the hours as light-heartedly as any two-year-old!

Helpful Hannah Says . . .

If the ironing sheet you use is folded, insert a sheet of newspaper under the top layer of sheet. The sheet will then remain flat and even.

* * *

If your navy serge costume has grease spots on it, heat some common salt in the oven, and this will remove the stains.

* * *

The secret of making successful meringues is to add a pinch of salt to the egg whites, and beat these till stiff, before gradually adding the sugar.

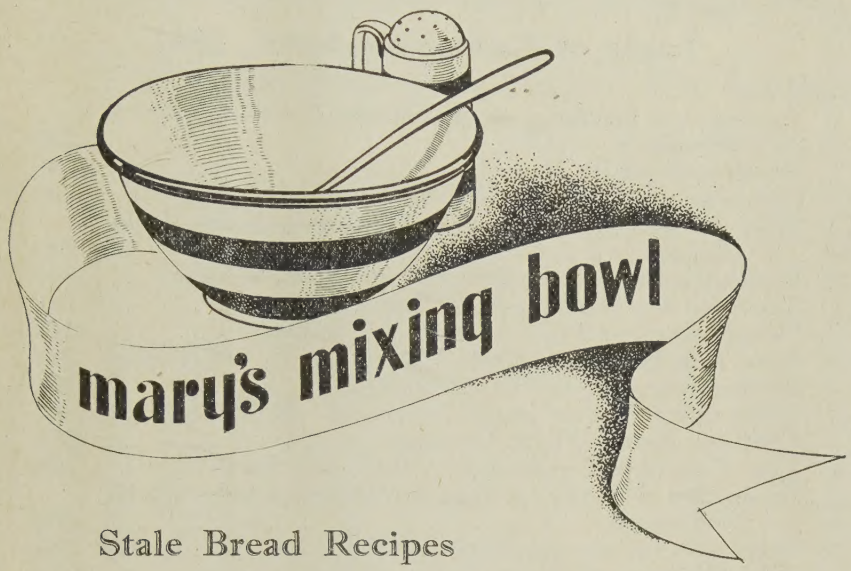
* * *

It is easy to clean your burnt saucepan if you fill it with salt and water, and bring it slowly to the boil the following day. Boiling onions in a burnt saucepan will often do the trick.

- - - EAT APPLES

Apple time is here! Apples red and apples yellow, packed with delicious, health-giving juices that are so essential for every one. Crisp, juicy apples, sweet or tart, according to your taste. Apples are good for your teeth. Apples give energy. Eat apples every day, especially after meals—it's a delicious habit. Eat apple pies and apple puddings. Apples cannot be exported this year—so do *your* bit for National Health and National Service—buy apples by the case—and eat plenty!

Serve Apples
—and Serve Your Country!



Stale Bread Recipes

SAVOURY CRISPS.

Cut stale bread into thin slices. Spread with butter and marmite. Sprinkle with finely grated cheese. Cut into neat fingers and bake in a moderate oven until golden brown. These keep well when stored in an air-tight tin.—**Potato Top (Karamea).**

STALE BREAD AND TOMATOES.

2 slices of bread toasted, 2 slices of bread minced into crumbs, 6 medium tomatoes, 1 tablespoon butter, pepper, and salt.

Slice the tomatoes and put with butter into an enamel saucepan. Season with pepper and salt. Stir and cook till tender. Remove from fire and thoroughly stir in the breadcrumbs. Serve with toast.—**Country Cousin (Hauraki Plains.)**

Best Stale Bread Recipe

The prize of 2/6 for the best use of stale bread is awarded to Mrs. Edwin James, 14 Grosvenor Street, Cambridge, for the following recipe:—

FROSTED LEMON PUDDING.

3 eggs, 2 cups milk, 1 dessertspoon sugar, stale white bread, rind of 1 lemon (grated), lemon honey, meringue.

Half fill a pie-dish with tiny cubes of stale white bread. Separate yolks and whites of eggs. Beat yolks, add milk, sugar and lemon rind. Pour this over the bread. Stand dish in a pan of water, and bake until set. When set, spread with lemon honey and meringue. To make the meringue, beat egg whites until very stiff and add a little sugar. Put back in the oven, and brown lightly.

RHUBARB "SPONGE."

Wash and cut up sufficient rhubarb and place in pie-dish, with some sugar and a little water. Beat 1 egg and add a little milk, then let two slices of stale bread soak in this, and when the egg is all through the bread, place on top of rhubarb and bake until rhubarb is cooked. The above method is also suitable for gooseberries, apples, etc.—**Mrs. A. Hamilton (Oamaru).**

NEW SOUTH WALES PUDDING.

2 cups breadcrumbs, 1 cup sugar, 1 cup raisins, ½ cup salt, 1 piece peel, grated lemon rind, 1 full tsp. soda.

Three heaped tablespoons sago soaked in 1 cup milk all night. Mix all ingredients with soaked sago and steam four hours.—**Mary Ann (Bell Block.)**

JAM TREATS.

Cut slices of stale bread about 1 inch thick and then cut into small rounds with a ¼ lb. cocoa tin. Dip in condensed milk, and roll in desiccated coconut. Place on butter paper, then on a cold tray and bake in a very slow oven for about 30 minutes. When cold, join together in pairs with jam.—**Mrs. H.S.G. (Timaru.)**

STALE BREAD PUDDING.

Soak in milk buttered sliced bread in pie-dish for 1 hour or so. Then mash well and add small quantity each of sultanas, dates or raisins, or any other mixed dried fruit. Next, ¼ teaspoon spice, ¼ teaspoonful cinnamon, and a little grated nutmeg and lemon rind; also tablespoon sugar. Beat 1 egg with a little more milk and add to mixture. Bake in oven for ½ hour. Serve with cream.—**Mrs. F. Latham (Tauranga.)**

FRUIT CHARLOTTE.

Line a basin with slices of bread and butter, fill with boiling stewed fruit, and cover with more bread and butter. Put a plate and a weight on top and leave overnight, when the bread will be absorbed into the fruit, forming a jelly-like mould.—**Mrs. H. B. Chalmers (Gisborne.)**

STALE BREAD SWEET.

One-third fill a glass dish with stale crumbs, and on top of that put a tin of raspberries (or, better still, fresh ones if in season), make very hot, add sugar if liked, cool slightly, and pour over the crumbs, make a custard with eggs and cornflour (fairly thick) and pour over the raspberries. This sweet must be served very cold. The custard must be flavoured with vanilla.—**Mrs. N. Walker (Upper Riccarton.)**

"REFRESHED" BREAD.

Take a stale loaf (either white or brown), the staler the better, and wet it all over with cold water, then place it in a moderate oven until it is dry again. You will find it even nicer than fresh cooked bread, especially if you do it just in time for a meal, and serve it hot.—**Mrs. D. Marra (Buckland.)**

STALE BREAD PIE.

Grease a pie-dish with dripping and put a layer of onions, then 2 or 3 cups of breadcrumbs, and thyme and sage, pepper and salt to taste; then a layer of tomatoes, cut up. Pour about ½ cup of water over this and put a lid or something to hold in the steam and put in the oven. This is very tasty and takes the place of meat, if you are short.—**(Mrs. W. Fraser, Rangiora.)**

Wholemeal Is Wholesome!

Yes, wholemeal is wholesome, but there are ever so many ways of making it appetising, too. Puddings, cakes, biscuits, scones—what is your favourite use for wholemeal?

Send your recipe to the "Mixing Bowl." A prize of 2/6 will be paid for the best recipe received by May 15, 1941.

APPLE COMPOTE

Pare the apples, cut the cores out, leaving them whole. Make a syrup, allowing ¾ lb. of sugar to a pound of fruit. When it comes to a boil, put in the fruit and let cook until clear, but whole. Remove the fruit to a glass bowl, dissolve one dessertspoonful of powdered gelatine in a ½ teacup of water and stir briskly into the syrup,

first taking off the fire. Then pour over apples and set in a cool place. Serve with whipped cream. Some add sliced lemons to the syrup and serve with a slice of lemon on each apple.

APPLE JAM (1)

6 lbs. fruit, 7 pints water, 7 lbs. sugar, ½ teaspoon salt.

Peel and core apples; put the peel and cores in with water; boil a few minutes till flavour is extracted. Cut the apples in slices; cover with the strained juice; boil till tender, then add sugar. Cook till clear and a bright colour, adding the salt about 10 minutes before taking up. A few cloves and lemon juice may be added to improve flavour. Bottle and cover next day.

APPLE JAM (2)

4 lemons, 1oz. cloves or 1lb. preserved ginger, 6 lbs. apples, 6 lbs. sugar, 3 pints water.

Peel, core and slice the apples. Tie peels and cores in muslin and boil with the apples and grated lemon rind about 1 hour, then remove peels and cores and add the sugar, lemon juice and cloves in a bag and boil till it responds to setting test (about 30 minutes). If preferred, remove cloves; pineapple (2 medium sized ones) may be substituted for the lemons and cloves.

AFGHANS.

6½oz. flour, 7oz. butter, 3oz. sugar, 3oz. cornflakes, 1oz. cocoa.

Cream butter and sugar, then add dry ingredients. Bake in small quantities for 15 to 20 minutes on greased tray. Ice with chocolate icing, and place a walnut on top.

LEMON PUDDING.

One teacup of sugar, creamed with 1 tablespoon of butter. Add 2 tablespoons of flour, juice and grated rind of 1 lemon, and beaten yolks of 2 eggs, 1 cup of milk. Beat whites stiffly, and fold in. Cook in dish of hot water for about one hour.

APPLE PUFF PUDDING.

Put ½lb. of flour into a basin, sprinkle in a little salt, stir in gradually 1 pint of milk. When smooth, add 3 eggs; butter a pie-dish, pour in the batter. Take ¾lb. of apples, core and cut in slices, and put in the batter; place bits of butter over the top. Bake three-quarters of an hour. When done, sprinkle sugar over the top, and serve.

SCRAMBLED MUTTON.

Two cups cold minced mutton, 2 tablespoons milk, a nut of butter. Heat these together, and when thoroughly hot break in two eggs, and stir well until the mixture thickens; season with salt and pepper, and serve very hot on toast. Tasty for tea.

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SEMOLINA CAKES.

1 pint of milk, 3oz. each of sugar and semolina, 1 egg yolk, essence of lemon to taste, and chocolate sauce.

Boil up the milk and sugar, add the semolina, stirring all the time, then add the egg yolk and essence of lemon, and leave to simmer until thick. Pour into a shallow dish, leave until cold, then cut into squares, and fry golden brown on both sides in butter. Serve with jam, or with chocolate sauce poured over them. To make the sauce, put three-quarters of a pint of water in a saucepan with 3oz. of icing sugar, and 2oz. of unsweetened chocolate. Bring to the boil, add a desertspoonful of cornflour mixed with two tablespoonfuls of water, add a few drops of vanilla essence, and stir until boiling.

BROWNIE BISCUITS.

2 cups flour, 1 cup sugar, 1 cup mixed fruit, ½ cup dripping, 2 teaspoons spice, 1 teaspoon nutmeg, 1 heaped teaspoon bicarb. soda dissolved in 1 cup milk, and 2 tablespoons vinegar.

Mix flour and dripping, add other dry ingredients, and then milk, etc. Bake spoonfuls on slide in moderate oven.

OMELET FRITTERS.

Mince ¼lb. cold beef or game and one small onion, add finely chopped cold vegetables, pepper and salt. Beat together an egg and ¼ cup of water, add self-raising flour to make a smooth batter, and stir in the mince. Heat pan with enough dripping to keep mixture from sticking to pan, and cook golden brown. A tablespoon makes a nice-sized, thick omelet. Serve hot with potato chips or green peas.

CINNAMON APPLE SQUARES.

Cream 3 ozs. of butter with ½ cup of sugar. When thoroughly mixed beat in an egg. Now add ½ lb. of flour, sifted with a teaspoon of baking powder and a teaspoon of cinnamon; mix thoroughly and roll out. The paste is a very short one and should be handled as lightly as possible. Divide it into two pieces. Have ready some cold stewed Sturmer apples which have been sweetened and flavoured with a little cinnamon. Place this between the two pieces of paste. Put on an oven tray and bake in a moderate oven.

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WITHOUT BEING DISPARAGING—

A FARMER recently called upon us, and after reading through a few original letters from a pile of literally hundreds that we have on our files, made the following comments:—

"Although we get a lot of useful information from farming journals, I am certain that no journal could publish a more instructive issue than one which contained only copies of these letters, and I reckon you've got enough here to fill any journal."

With the illustrated pamphlets (sent **Free**) of the "Bevin" Harrow are included leaflets containing abbreviated excerpts from scores of these letters. These contain much useful information to farmers generally, and alone are well worth sending for as they mention what can be done with an efficient harrow in practically every phase of cultivation and under all conditions. We venture to say that there is not one farmer in New Zealand who could not glean some useful information from them, so we look forward to sending you our complete literature, which will be despatched without obligation to you on receipt of the Coupon on this page, and on which are also reproduced a few samples of the letters we speak of.

THEY DO NOT JERK.

Writing on the 7/3/41, Mr. Ken Watchorn, of Pukeatua, says:—"When I purchased my 'Bevin' Harrow two years ago, I had 3 other types on the farm, but I disposed of these long ago, and the only grass harrow I now possess is the 'Bevin.' Some of my grass paddocks were 'dead' or 'hide bound' and grew very little feed, but **after only one good cut of the 'Bevin' they greened up and produced more than twice the feed.**

"Even in very dry weather when the paddocks are whitening off, **one good cut of your harrow will green them up** in a week. Three or more harrowings in a year pay well; **not only will it spread the droppings well, but it will allow the air to the roots of the grass and thus freshen up the paddocks.**

"This year I have broken in 40 acres of new scrub country with giant discs and used the 'Bevin' to level off the bumps, and **really it worked wonders.** In discing I rode over dead manuka, etc., some 12in. or 14in. high and harrowed over straight after. I found—and this is what finally made me drop chain and tripods in favour of the 'Bevin'—that your harrow did a better job, and cleared itself of sticks much easier than other makes do. They are much easier to pull than tripod and chains **and much easier on the horses' shoulders, as they do not jerk."**

BEST FOR LUCERNE.

On the 20/2/40, Mr. Vic. Aickenhead, of Parakai, Helensville, wrote:—

"After using your harrows both for grassland harrowing and for cultivation of lucerne, I can express only admiration for the results achieved. Our country is inclined to grow rat-tail, and the 'Bevin' harrow is the only job that will penetrate and open up the sward, much to the dismay of the rat-tail.

"For the cultivation of lucerne there is nothing in the world like the 'BEVIN.' We work the harrow with the teeth right down. Three horses pulling a 10ft. set. The beauty of the harrow is that it won't clog up.

"Any rubbish it pulls up, it drops behind evenly and not in heaps rolled up that tight that you cannot unravel.

"Our lucerne crop was that weedy that we almost despaired of cleaning same. We harrowed four times with the 'Bevin' and today **the experts claim there is not a finer or cleaner stand in the country.** Thanks to the 'Bevin.'

"Wishing you all the best with sales."

HE DID NOT BELIEVE IN HARROWING

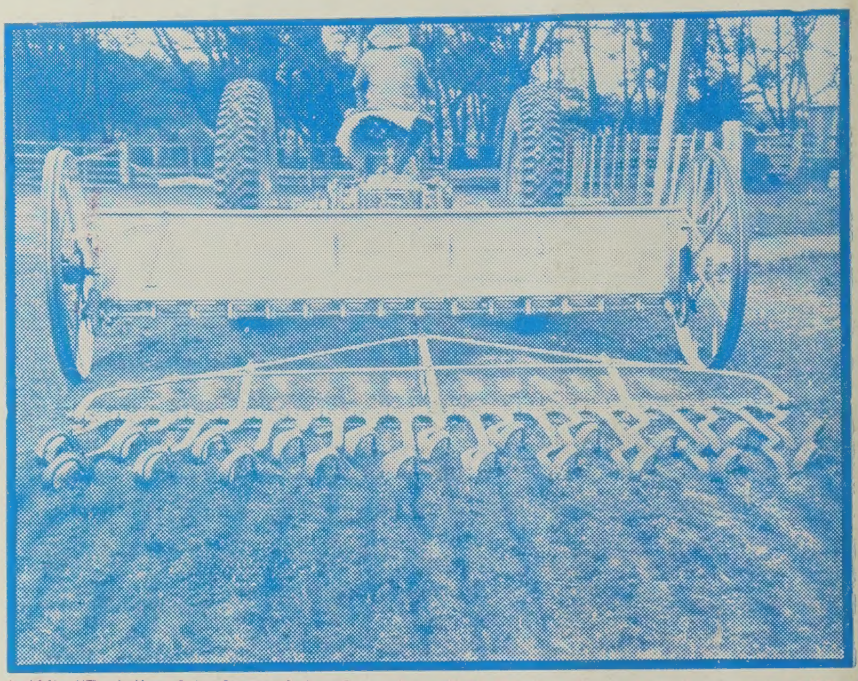
Here is the story of a very progressive farmer who, however, had been influenced by articles published from time to time by so-called experts, wherein it was stated that harrows did not benefit the pasture.

Four years ago one neighbour bought a "Bevin" and got splendid results, with the result that another neighbour bought a "Bevin" the following year. Then again in the third year another neighbour bought because of the benefit the first and second users of the "Bevin" had obtained. Finally Mr. O. A. McCaw, of Papatoetoe, was convinced of the fallacy of his previous opinion, and in 1940 he purchased a "Bevin." Here is a letter he wrote to us on 2/10/40:—

Promotes Winter and Early Spring Growth where Artificials Fail.

"I bought your harrows at the end of June and harrowed the whole farm except one paddock, spread over about a month. After we had finished, it was possible to see which paddocks had been harrowed first, second, third and fourth, by the difference in the growth and colour. The whole place had been top-dressed in January and February last with a bought mixture of super potash and burnt lime (£6/2/6 per ton). The difference between this paddock and the rest of the farm is remarkable. Although **this particular paddock had 7cwt.** of the above mixture applied, **it is not a patch on the rest of the farm,** for feed and density of growth."

At the beginning of February, 1941, Mr. McCaw told us that the paddock on which he had put the 7cwt. of fertilizer had not responded in the Spring and was still much inferior to the other paddocks, so, during a dry spell in November, 1940, he harrowed it. Immediately after the first shower of rain for the first time this paddock really came away. He also mentioned that this year he is applying 33⅓ per cent. less fertiliser than previously.



A 10ft. "Bevin" and topdresser being drawn by a light Tractor. Notice how the manure visible on the ground under the box is incorporated in the slight mulch caused by the harrows. Tests have proved that manure applied in conjunction with the "Bevin" Harrow will get 50 per cent. better and much quicker response.

WHAT TARANAKI FARMERS HAVE BEEN WANTING FOR YEARS!

On the 12/8/40, Mr. D. Hildred, of Surrey Road, Tariki, says:—

"I consider that your harrows are what Taranaki farmers have been wanting for years. They do just what the other harrows don't do—**they loosen the grass roots in any weather conditions,** whereas all other harrows are only effective when the ground is very wet and soft.

"There is another thing that adds greatly to the value of the 'Bevin.' It is very durable—**the only upkeep being the teeth.** Wishing you the best of luck in the sale of your harrow. I can assure you that anybody can buy a set of 'Bevins' with every confidence."

RECOMMENDED FOR CHEVIOT DISTRICT

Writing on the 22/6/40, Mr. C. G. Abbott, of Cheviot, says:—

"Your harrow has carried out its duties exactly as I expected, and I believe it is specially suited for Cheviot country, composed as it is mostly of clay sub-soil, with pastures on top going very hard. I top-dressed with lime and super with the harrows in front, and **I am unable to think of any better treatment for grass land.** You may use my name as specially recommending this harrow for Cheviot country. **The Right Hon. G. W. Forbes, M.P.,** asked me my opinion of your harrow."

(Pamphlets were sent to Mr. Forbes, who ordered an 8ft. set by mail on the 23/7/40.)

IT IS BECAUSE I HAVE RECEIVED HUNDREDS OF LETTERS SIMILAR TO THESE THAT THE "BEVIN" IS SOLD ON A WRITTEN GUARANTEE OF SATISFACTION TO YOU, EVEN TO RESULTS. A copy of this warranty will be sent with full particulars of the "Bevin" on receipt of this **convenient Coupon.**

The 1d. or 2d. necessary for postage will be the best investment you have ever made, **but please, when sending it, don't forget to fill in your name and address.**

CONVENIENT COUPON FOR THE USE OF ALERT FARMERS.

To A. S. Bevin, Dept. J.,
38 Albert Street (Box 880), Auckland.

Without obligation, please send me fully Illustrated Catalogue, etc., of your Harrows, together with a **copy of your written guarantee of satisfaction to me, even to results, or money back.**

NAME .....

ADDRESS .....

..... J.A.,1/4/41